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EXTINCT VOLCANOES OF NORTHEAST NEW MEXICO

By WILLIS T. LEE

TRAVELERS over the Santa Fe route in Colorado and New Mexico are probably all familiar with the striking scenic features near Raton Pass. Chief among these is Fisher's Peak, the most conspicuous object in view as one approaches Trinidad. It is an impressive mass of rock that rises more than 3,500 feet above the city, where the traveler stops for refreshment and where the engine that has raced for hours over the plain retires and gives place to fresh ones that pant and throb with impatience for the long climb over the pass. This peak, which by the way is not a peak at all, but is the point of a flat-topped table-land known as Raton Mesa, has a pointed appearance when viewed from below, because of the angle of observation. It is the northwestern extremity of a volcanic region stretching eastward through southern Colorado and northeastern New Mexico into Oklahoma, a distance of more than 80 miles. It is far removed from the Rocky Mountains, its western extremity being nearly 50 miles from the foothills.

This region contains many unique and attractive scenic features, but for the most part these lie at considerable distances from ordinary lines of transportation, and because they are in a sparsely settled and little known part of the country almost nothing is known of them by the general public. The volcanic activity of former times is evidenced in this region by the pres-

ence of great sheets of lava, dikes, plugs, intrusive sills, conical mountains of igneous rock obviously of volcanic origin but without depressions at their summits indicative of craters, and other mountains which are unquestionably volcanic but wanting in the symmetry of form that usually characterizes a volcano.

The lava flows date back to some unknown period whose antiquity it is quite useless to speculate upon. Since the time of the flow of which Fisher's Peak constitutes a part, erosion has removed from the country to the north rocks about 3,500 feet thick. The mesa maintains its form because of the superior hardness of the igneous rock at the top. This covering varies in thickness from 100 feet or less to 500 or 600 feet. It was not formed by a single welling out of molten rock, but by many successive flows. It consists of numerous sheets, probably separated by long intervals of time, and were the history of the lavas known it would doubtless prove to be a long and varied one, extending over centuries of time; and yet, as compared with the duration of time that the volcanic forces have been active here, the formation of the lava sheet seems like a single event. The surfaces of these great mesa flows are more or less irregular, and from them rise such elevations as Red Mountain and Townsend Peak. The summit of the latter rises about 450 feet above the general



FISHER'S PEAK AS SEEN FROM NEAR TRINIDAD, COLO.; A PART OF THE RATON MESA
STANDING 3,500 FEET ABOVE THE POINT OF OBSERVATION.

level of the mesa and Red Mountain is considerably higher. These elevations have the conical form of volcanoes, but if they ever possessed craters all evidences of them have been destroyed.

The older and more extensive sheets of lava are supposed to be products of fissure eruption. The molten rock welled up through great cracks in which the lava finally solidified, giving rise to the dikes now exposed in the eroded areas surrounding the mesas. In some places also the lava was extruded through relatively small pipes. In these pipes the lava consolidated and inasmuch as it is harder than the rocks through which it found passage, it has not been eroded so fast as the soft rock surrounding it, and the solidified filling of the pipes now protrude from the surface as "plugs" such as Water-vale Butte.

After the first group of lava flows had been formed, there seems to have

been a cessation of volcanic activity and the lavas were attacked by erosion. The sheets were cut through and great quantities of them, as well as of the older rocks, were eroded away. Then the dormant forces became active again and other lava sheets were formed in the degraded areas below the older sheets. The younger lavas, at least in part, issued from volcanic vents and the volcanoes formed about these vents still remain, but in their turn these lavas were attacked by erosion and deeply dissected before still later eruptions occurred, resulting in the recent flows and in such perfect cinder cones as Mount Capulin and others illustrated in this paper, a dozen or more of which were formed.

There were three well-marked periods of volcanism in this region separated by long periods of time and doubtless numerous less well-marked



CAPULIN MOUNTAIN, AN EXTINCT VOLCANO OF RECENT ORIGIN, NEAR FOLSOM, N. M., AS SEEN FROM THE TOP OF A NEIGHBORING VOLCANIC PEAK FIVE MILES AWAY. THE CINDER CONE RISES NEARLY 1,500 FEET ABOVE THE PLAIN.

periods will be recognized when the region is studied in detail. Three periods are well illustrated in the canyon of the Dry Cimarron, where the rim of the canyon consists of lava belonging to one of the ancient sheets. This sheet was eroded and the canyon cut down nearly to its present depth when a flood of lava was poured into it probably from the crater of Mount Emery, an extinct volcano standing about a mile south of the Cimarron. The sheet thus formed within the canyon was later partly eroded away. The bed of the canyon was lowered slightly below its present level when a great stream of lava, presumably from Capulin, flowed down the canyon for a distance of about 27 miles filling the stream bed and overflowing it in some places, spreading to the confining walls of the canyon. The surface of this youngest lava constitutes the present floor of the canyon.

Just as there are three conspicuous and well-defined periods of lava flow in this region, so are there three distinct groups of extinct volcanoes which correspond in time, in a general way, to the lava flows. The oldest is represented by Sierra Grande which is the only one of this group known to the writer; the second, by Robinson, Emery, and half a dozen unnamed peaks; and the youngest group by Capulin, the Horseshoe, and a large but undetermined number of volcanic cones of recent origin.

THE SIERRA GRANDE

Sierra Grande forms one of the most conspicuous geographic features of the volcanic region of northeastern New Mexico. It is a conical mountain of volcanic origin, about 10 miles south of Folsom, New Mexico, standing

alone on the great plain, which toward the east, south, and west stretches away nearly level as far as the eye can reach. It is the largest and probably the oldest of the extinct volcanoes in the region described. If there are older volcanic mountains the evidence of their extrusive origin has not been found. Its altitude is given on some of the maps as 11,150 feet, but my aneroid registered little more than 8,000 feet at the top. The cone is nearly circular in outline and the slopes of the sides are gentle. There is a fairly well-marked crater at the summit, but one side is broken down, leaving a crescent-shaped rim enclosing the old crater which was estimated to be half a mile across. This rim is gently rounded at the top, and its breadth in some places is quarter of a mile or more.

The rock is dark colored andesitic lava varying in character from vesicular to compact. No cinders or scoriaceous material was found on the outslopes, but beds of red cinders occur within the crater. The slopes seem to be made up of successive flows of lava having approximately the same gradient as the mountain slopes, so that the mass seems to be composed of concentric layers like an onion. The outer edge appears to be lobed, due to the extension of some flows beyond the limit of others, but this character was noted only from a distance. No evidence of explosive action was found in Sierra Grande. The character of the rock and the gradient established by its flows indicate a volcano of quiet action in which the lava poured over the rim or broke through the side without violent demonstration as that from Kilauea does at the present time.

Canyons have been cut to a depth of 200 feet or more in the sides of Sierra Grande. Erosion to such a depth in hard andesitic rock in a semi-arid region where the only water available for erosive work is the slight amount that falls on an isolated cone, is evidence of a long period of time. No canyons at all comparable to those of Sierra Grande were found on other vol-

canic cones of this region. This, together with the subdued form of the cone and the rounded contours of its surface, seems to place Sierra Grande in a class apart from the other volcanic mountains of the region and to prove that it is the oldest of the cones now known to be of extrusive origin.

ROBINSON MOUNTAIN

Robinson is the name given to a volcanic mountain located about 7 miles southwest of Folsom, New Mexico. It has an altitude of about 8,000 feet, but inasmuch as the cone rests upon a broad and rather high mesa it is much less conspicuous than the neighboring mountains of about the same altitude. The sides of the cone are steep in some places, but on the whole the approach to the summit is easy. There is a well-defined depression in the summit but the confining rim is broken away on one side so that the crater has a cirque-like form. The rock is highly scoriaceous and much of it has the character sometimes known as "rock foam," that is, the gas cavities constitute so large a proportion of the rock that it will float in water like a cork. In some of this rock the gas cavities are so uniform in size and so regularly distributed that some people who are ignorant of its origin call it petrified honeycomb.

The fact that Robinson Mountain is younger than Sierra Grande and older than Capulin is proved in several ways. Although composed of rocks much softer than that of Sierra Grande, it has not been so deeply dissected by erosion and it rests on a lava platform much lower than the lavas of the high mesas that resulted from the earlier volcanic eruptions. On the other hand, the platform is much higher than that on which Capulin stands, and the rounded outlines and soil-covered surface are in marked contrast with the rough, angular outlines and fresh appearance of the "mal pais" surrounding the younger cones.

CAPULIN MOUNTAIN

Capulin is the name given to a magnificent example of extinct volcano near



CAPULIN MOUNTAIN AS SEEN FROM THE PLAIN BELOW IT.

Folsom, New Mexico, about 30 miles southeast of Raton. Until recently it has been readily accessible only from Folsom, a small town on the Colorado and Southern Railway, but recently a railroad has been constructed from Raton eastward which passes within three miles of the summit. The mountain has an altitude of about 8,000 feet or about 1,500 feet above the general level of the plain on which it stands. There is a broad platform at its base built up by successive flows of lava, and on this platform rests a steep-sided crater cone nearly circular in outline and probably a mile and a half in diameter at the base, having a well-defined crater at its summit. The bottom of the crater is about 75 feet lower than the lowest part of the rim and about 275 feet lower than the highest part. Its diameter from rim to rim was estimated at 1,500 feet.

The lava platform on which the cone stands is composed of scoriaceous, ropy lava evidently extruded from Capulin in the early stages of its vol-

canic activity, in successive flows separated by considerable periods of time. Some of the older lavas where they were not covered by more recent ones have decomposed at the surface forming a thin layer of soil in which grass and shrubs have taken root. Some of the younger flows have all the earmarks of recent origin. They are very slightly decomposed, are scoriaceous and ropy, and have fractured crust, cavernous openings, blister cones, etc. In short, they form typical "mal pais." The appearance of the nearly vertical faces of some of the more recent flows suggests a rapidly advancing tidal wave frozen in transit. As the surface of the molten rock cooled the solid crust at the advancing front was fractured and rolled under, and when the whole mass ceased to move this rolling front stopped in the position seen at the present time. In some places where the nearly vertical front is 25 to 30 feet high, scarcely a block has fallen from it, so recently was it formed.



A "BLISTER CONE" AT THE BASE OF CAPULIN MOUNTAIN.

It is probable that in its early stages Capulin was a much broader volcano than its present cone would lead one to believe. The quantity of material outpoured would seem to require a very large vent. Lava that would flow 27 miles before it congealed, as in the case of the flow down the Dry Cimarron, would seem to require a larger crater than the one now in evidence in Capulin Mountain. Furthermore, there are remnants of what may have been an old crater rim outside of the present cone. The crater cone is composed in part of flow lava, in part of cemented breccia, and in part of unconsolidated cinders. The cinders are rather fine and make climbing difficult, inasmuch as one's feet sink ankle deep into them at every step. The occurrence of these loose cinders in the sides of the mountain where the conditions for rapid erosion are most favorable speaks rather eloquently of the recency of the eruptions that extruded them. The formation of the cinder cone was the last and relatively feeble effort of the dying forces, but although it is surrounded by several small craters, no solfataras, hot springs or other evidences of slumbering fires have been found.

"MAL PAIS"

Near Capulin, as in many other places in the volcanic region, there are extensive sheets of fresh lava, which in New Mexico are ordinarily called *mal pais*, a name meaning "bad country." The appropriateness of this name becomes forcefully evident when one attempts to cross a field of fresh lava. It is said by some that the name was applied years ago by soldiers who had been sent to fight the Indians. No hoofed animal can make its way for any considerable distance over fresh *mal pais*, for the knife-like edges of the lava cut its hoofs to pieces in a short time. Knowing this fact, the Indians, when chased by cavalrymen, took refuge in the lava fields where they were acquainted with the tortuous trails that led through the *mal pais*. The cavalrymen could not follow these, and once off the trail their horses were soon disabled.

There were probably reasons other than safety why the Indians frequented the *mal pais* fields. Small caves are numerous, formed by the still fluid lava flowing from beneath a hardening crust. These caves afforded shelter for the savages. Smaller cavities offer shelter for rabbits that inhabit the *mal pais* fields in countless myriads. These



HORSESHOE MOUNTAIN, A VOLCANIC CINDER CONE OF RECENT ORIGIN, NEAR CAPULIN MOUNTAIN.

in turn attracted wolves, wild cats, and other savage animals, as well as savage men, so that good hunting was afforded as well as safe habitation. Also, the cavernous "mal pais" has the power of this semi-arid region, and springs of pure water often occur in or near it, although in other kinds of rock in the same region the springs may be very poor or wholly wanting.

BLISTER CONES

Blister cone is a name applied to certain elevated parts of the surface of mal pais. They are often conical, globular, or elliptical, and consist of irregularly shaped blocks of lava. In the more perfect ones these blocks are arranged in symmetrical order as if fitted together by design. Obviously, they were formed at a time when a solid crust had formed at the surface of the lava that was still viscous below, and shortly before the whole mass ceased to move. Thus the rigid crust buckled and broke as the viscous mass beneath continued to move. The early blisters were destroyed entirely; later ones, broken and warped out of shape, appear now as heaps of blocks without symmetry of form; still later ones appear in such perfect symmetry as the

one illustrated; and the last to form may appear as oval mounds of slight elevation. Blisters may be found showing every stage from the first slight buckling of the crust to unsightly heaps of angular blocks.

In the more perfect blisters the form and structure indicate that the blocks are parts of a once continuous crust or sheet of lava, although they are now separated by considerable distances. In many places the cavities are large enough for a man to crawl through. Into the base of one of these blisters near Capulin, a young man who accompanied the writer made his way on hands and knees, and after a tortuous passage among the blocks he emerged from the top, 20 feet above the point where he had entered. This, however, is an operation that few would care to repeat, for the knife-like edges of the lava cut one's clothing and lacerate one's hands. But the more serious objection arises from the fact that rattlesnakes which infest this region regard these cavities as their own private domain. The dark-colored lava is warmed by the rays of the sun, and these venomous "sons of Satan," as they are often called, seem to find conditions here quite to their liking. Their



WATERVALE BUTTE, A VOLCANIC PLUG OF BASALTIC ROCK IN SOUTHERN COLORADO, SURROUNDED BY SOFT SHALE.



ROBINSON MOUNTAIN, AN EXTINGUISHED VOLCANO NEAR FOLSOM, N. M. MOUNT EMERY, ANOTHER MOUNTAIN OF VOLCANIC ORIGIN, APPEARS IN THE DISTANCE AT THE LEFT.

color differs but little from that of the lava, and it is no uncommon thing for beast or man to step on a sleeping reptile before he knows of its presence. Fortunately, a rattlesnake will usually give warning of his belligerent intent before beginning hostile operations, and he prefers blissful solitude to the society of those who never neglect an opportunity to bruise his head. Nevertheless, while in the lava fields, the writer learned, after several narrow escapes, to examine a rock rather carefully from a biological point of view before examining it geologically or before sitting down on it to rest. The snake is especially peevish about his sun bath, and the man who disturbs his slumbers by sitting down too near him is very likely to rise again without his desired rest.

HORSESHOE MOUNTAIN

Horseshoe Mountain is the crater cone of an extinct volcano consisting at the surface entirely of scoriaceous

cinders. It is nearly circular in outline and the rim of the crater is broken down on one side, giving to the crest the general form of a horseshoe. The cone rests on a broad platform of flow lava that is relatively old. Its surface is rolling, and it is covered with soil, but the cinder cone is very young. Although it is composed of loose or slightly consolidated material that washes down in considerable quantities with every rain, giving the surface a corrugated appearance, the sides are still nearly as steep as it is possible for them to be with loose material, and the absence of large accumulations of cinders at the base that can be attributed to wash from its slopes indicates that the cone still retains essentially the form that the extruded material originally assumed.

The Horseshoe is typical in many ways of the younger volcanic cones of northeastern New Mexico. During their early eruptions the lavas seem to have flowed out gently, but the last

eruptions were mildly explosive. Cinders were blown out, but settled close to the crater building up the conical mounds. In some cases small bombs were ejected. Great numbers of bombs 4 to 5 inches in diameter were found in the sides of the Trinchera volcano, but even here the action seems to have been relatively mild for the cinders and bombs are arranged in evenly laminated beds which are steeply inclined in the sides of the cone as indicated in the illustration.

There are no known data by which one can compute in years the time that

has elapsed since the last eruption, but geologically speaking, the formation of the volcanic cones, like Horseshoe and Capulin, was the last event of the region, and although volcanic forces may have been inactive for a hundred years or more, it is quite impossible to know whether the fires are extinct or only slumbering, and as one stands on the rim of a crater and contemplates the result of the titanic forces so recently in operation, one can scarcely escape the gruesome thought that these forces may be only slumbering and may awaken at any moment.

PROTECTING NEW HAMPSHIRE FORESTS

IN its annual report, recently issued, the Society for Protection of New Hampshire Forests tells what it has accomplished in the ten years of its existence. It says:

"The Society takes much satisfaction in the results of its ten years' work. While the problem of saving New Hampshire's forests for their greatest use, by adopting a saner method of harvesting the product, is still largely unsolved, yet we begin the second decade with far more hope and confidence than at the time of organization. We have helped to secure legislation at Washington and at Concord, which gives the forests of the state more nearly adequate fire protection, stimulates reforestation, encourages careful management, and reserves completely some of the places of special attraction. Ten years of educational work has been faithfully done. It is possible to believe that the time may not be far distant when the annual harvest of timber in New Hampshire will not exceed the annual growth, and when large areas of timber, valuable for scenic beauty and for protecting the flow of streams, are permanently safe from ordinary destructive lumbering and from the ravages of soil-consuming fires.

"The reorganization of the State Forestry Commission was one of the first and most important objects. The Society was organized because a few men and women, who met at the call of Gov-

ernor Rollins ten years ago, were not satisfied with the progress of the forestry movement in New Hampshire. With the rapid development of the paper and pulp industry, forests in the mountains were being swept away with no effort within the state to save them. Few realized the importance of saving timber as a source of supply for the future needs of a growing population; fewer believed that the mountain forests could be protected in a manner to prevent the rapid run-off of streams over areas sufficiently large to affect the water-powers and navigation.

"The new Society at once undertook an educational campaign. It employed a forester who spoke at meetings of all kinds throughout the state, showing by photographs and lantern slides the actual conditions, and pointing out what other states were beginning to accomplish. With the appointment of Mr. Robert P. Bass, now Governor, and Mr. Robert E. Faulkner, of Keene, to the Forestry Commission, and with the co-operation of General Tolles, of Nassau, who was already a member, an efficient and progressive administration of the State Forestry Department was brought about. Legislation, advocated by the Society, was passed, securing the appointment of a state forester. The fire laws were rewritten. Co-operation from the Federal Forest Service was secured.

"From its first year the Society ad-



TUCKERMAN'S RAVINE, IN THE PRESIDENTIAL RANGE, WHERE SNOW LINGERS THROUGHOUT THE YEAR. THE FOREST GROWS UP TO THE EDGE OF THE SNOW-BANK. THE SOUTH SLOPES OF THE PRESIDENTIAL RANGE SHOULD BE INCLUDED THIS YEAR IN THE NATIONAL FOREST RESERVE.

Photo by Gay L. Shorey, Gorham.



TOP OF THE CASTELLATED RIDGE, MT. JEFFERSON. THE NORTH SLOPES OF THE PRESIDENTIAL RANGE WILL BE INCLUDED IN THE NATIONAL FOREST.

Photo by Gay L. Shores, Gorham.



LAKE SOLITUDE. OF GLACIAL ORIGIN, 2,500 FEET ABOVE THE SEA, NEAR THE TOP OF SUNAPEE MOUNTAIN.
ALL OF THE TIMBER AROUND THIS LAKE HAS BEEN PURCHASED.

vocated a National Forest in the White Mountains, and engaged actively in work for this object several months before the Intervale meeting, called by Dr. Edward Everett Hale for the same purpose. Dr. Hale became an honorary life member of the Society, and worked early and late for a National Forest in the White Mountains. It was a sincere regret that his death came before the bill was finally enacted; but his faith foresaw the result, in which he found much satisfaction. The enactment of the Weeks bill, in spite of active opposition from the leaders of both political parties, was a triumph of popular agitation throughout the length and breadth of the country. In this nationwide agitation the Society took a prominent part, as its present wide membership list testifies. The co-operation of the men of the South was particularly gratifying. The governors of the New England States and the Southern States appeared repeatedly together before committees of Congress. The battle was won and the President signed the bill on March 1, 1910.

"Since its formation one object of the Society has been the acquisition of the forest lands by the state and town governments in New Hampshire. The Crawford Notch is one of the famous pieces of scenery in the White Mountain region. When logging operations threatened to disfigure it, the Society proposed that it be acquired by the State of New Hampshire, and a bill was prepared for the legislature. The suggestion was promptly approved by Mr. W. A. Barron, of the Barron & Merrill Company, and the late John Anderson, of Bretton Woods. The Appalachian Mountain Club joined with the Society in an appeal for funds with which to carry on the campaign. A complete and careful survey of the timber in the Notch was made by the Society and maps were drawn. The bill was passed in the session of 1911. Through a clerical oversight it proved defective, and the state is unable to issue the bonds authorized in the bill to buy this property; but owing to the interest and energy of Governor Bass, the difficulties have been partly overcome and the more picturesque portions of the Notch, the northern half, are be-

ing purchased from current state funds.

"In 1909 the residents around Sunapee Lake began a campaign under the leadership of Mr. Herbert Welsh, of Philadelphia, for acquiring the forests on Sunapee Mountain. They invited the co-operation of the Society, which aided in the technical forest work and in the legal work required. Through the efforts of Mr. Welsh, \$8,000 have been subscribed and six hundred and fifty-six acres purchased, covering the entire top of the main mountain, besides the north and south peaks, with the long sky line, and Lake Solitude, a charming body of water, near the top of the main mountain, with the timber around its entire margin. At the request of the contributors the entire property has been placed in the care of the Society as trustee, together with a fund of \$500, covering the expenses of management for a term of years. Now that the purchase has been completed, the contributors seek additional funds with which to clear up the slash and make trails. The Society believes that when the plans adopted are fully developed, Sunapee Mountain will become a most beautiful mountain park.

"The Society made an appeal during the past winter, for sufficient money to accept a gift of the Lost River and one hundred and forty-eight acres of land adjoining it, offered by the Publishers' Paper Company, provided the Society would buy the standing timber upon the tract. This, on careful estimate, was found to amount to \$7,000. By means of a legacy of \$5,000, left by Miss Dora Martin, of Dover, a portion of which became available, together with contributions amounting to \$1,315 from the prominent hotels in the White Mountains, and the remainder from generous contributions on the part of a large number of members and friends of the Society, the gift was accepted, and the timber purchased. Lost River is located seven miles west of North Woodstock. The region is one of great beauty, majestic in its setting and charming in detail.

"For ten years the forester of the Society has been examining woodlands throughout the State, giving advice to the owners on methods of management. Since the reorganization of the For-



THE CRAWFORD NOTCH. THE UPPER AND MORE PICTURESQUE HALF OF THE NOTCH IS BEING PURCHASED FOR THE STATE OF NEW HAMPSHIRE BY THE GOVERNOR AND COUNCIL, NOTWITHSTANDING THE DEFECT IN THE LEGISLATIVE BILL.

Photo by Kitchin, Littleton.

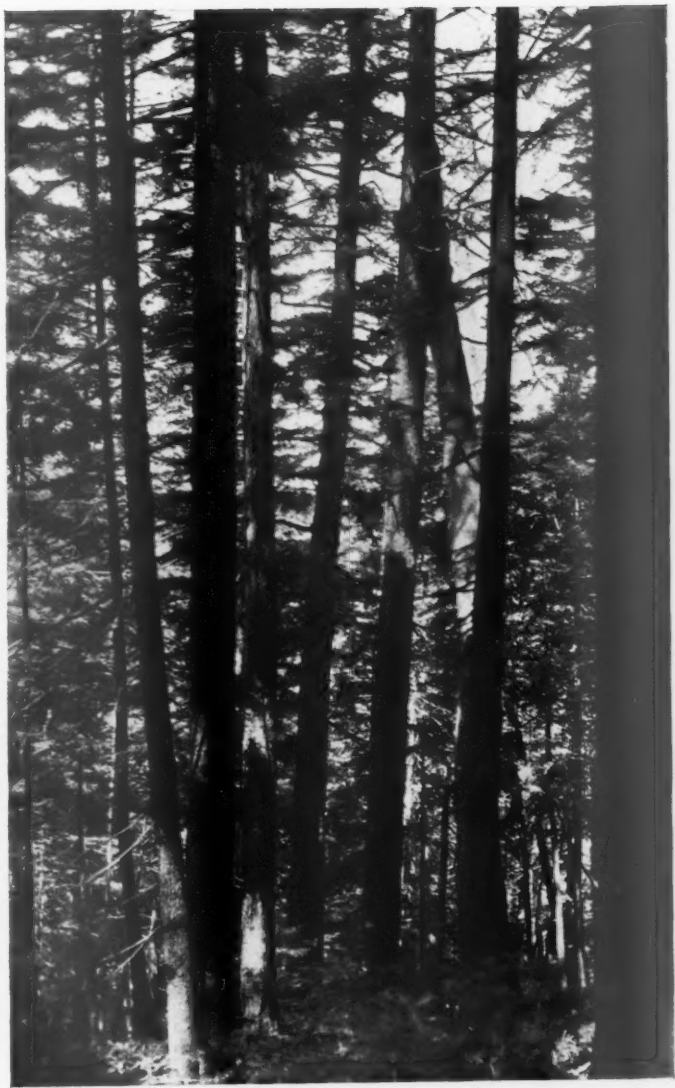
LOST RIVER IN WINTER. AT THIS POINT THE STREAM ENTERS THE CAVERN.





AFTER FIRE ON THE PRESIDENTIAL RANGE. FIRE SWEEPED UP FROM LOGGING OPERATIONS BELOW THAT WERE NOT PROPERLY GUARDED.

Photo by Guy L. Storey, Gorham.



PRIMEVAL SPRUCE TIMBER ON MT. WEBSTER. A PART OF THE NEW HAMPSHIRE STATE PURCHASE IN THE CRAWFORD NOTCH.

Photo by William R. Pearmain, Dublin.



PARADISE FALLS, LOST RIVER. AT THIS POINT THE STREAM EMERGES, PLUNGES THIRTY FEET, AND ENTERS ANOTHER REMARKABLE SERIES OF CAVERNS BELOW.

estry Commission, the state forester and his assistants have been doing the same. During the past year two additional foresters, one employed by the Timberland Owners' Association and another by the State College at Durham, have taken part. This means that a very large aggregate of timbered land is managed with a view to a better crop instead of in a haphazard manner. With the advance in the price of timber, owners have realized that the advice given is valuable in helping them to produce better material and avail themselves of better markets.

"From the start the Society has realized that a fundamental change in public sentiment, through the education of the people as a whole, is a necessity if it would accomplish its desired results in a substantial manner. To improve the forests of the state requires a long continued public interest, which can only be secured by thorough knowledge on the part of a large number of

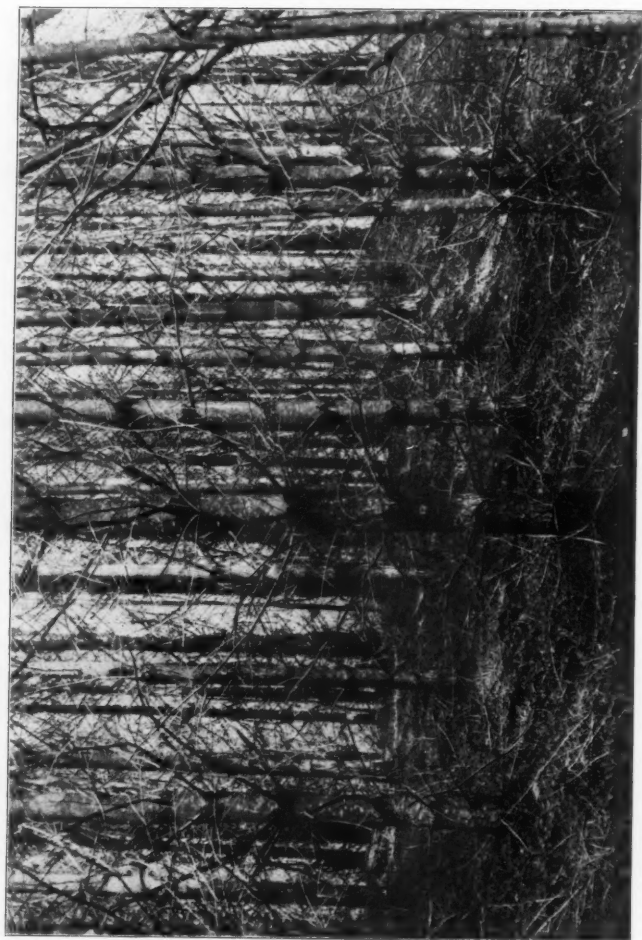
citizens. The Society is happy upon having on the statute book at this time every one of the important legislative measures which it undertook at the time of its organization.

"At this time there are four reservations in the hands of the State Forestry Commission in addition to the Crawford Notch purchase. There are two in the care of the Society, the Sunapee and Lost River tracts. These are in addition to seven reservations in the care of the Appalachian Mountain Club, for which the Society is not responsible. Several beautiful forests in the state are owned by individuals, and held free and open to the public use. Striking examples of these are the forests purchased and held for public use by Mrs. B. P. Cheney in Peterborough, Mr. Daniel C. Remick in Littleton, and the beautiful pine woods on the road between Bethlehem and Franconia, held for public use by Miss Sarah H. Crocker, of Boston."



PINE WOODS IN KEENE. \$64.00 PER ACRE LEFT STANDING TO GROW.
\$48.00 PER ACRE (NET) HAS BEEN THINNED OUT.

Photograph from U. S. Forest Service.



PINES PLANTED TWENTY-EIGHT YEARS. FIVE FEET APART EACH WAY, WHICH IS THE BEST SPACING. THINNINGS NOW HAVE COMMERCIAL VALUE.

Photo by F. W. Hayward, Keene.

THE LOGGING ENGINEER IN THE PACIFIC NORTHWEST

By A LOGGING ENGINEER

SINCE entering corporation rather than Government or State employ, I have received quite a number of letters from prospective foresters asking for information as to just what opportunities were offered a technical man with private logging and timber companies in this section of the country. The purpose of this article will be to set forth very frankly the advantages and drawbacks of such employment; the ultimate reward to which he may look forward, if successful, and the special preparation needed for this particular line of work.

In the Pacific Northwest we are not yet to that stage of development in which our timbermen and millowners can see the end of their resources in the near future and are sufficiently jarred by the prospect into taking steps to provide for a perpetual timber yield. As a matter of fact we cannot even approximately utilize our present waste. We are simply in the position of Wisconsin and Minnesota in the 90's with the important exception that our business men are wiser from past experience and the most of them more than willing to take any necessary steps to avoid the serious consequences of an exhaustion of our timber supply, provided they can get together, as to ways and means, and can be shown that dollars invested now will at least earn their 5 per cent a year. That we are progressing along the right lines is shown by our forest fire laws and their effective enforcement, and by the very able work done by Mr. E. T. Allen, forester for the combined timber and fire associations of our Northwestern States. So far this work has been mostly educational and tending toward the enactment of such laws as will enable the work of providing for future generations to be put on a sound and profitable basis.

I would like to call attention to one fundamental difference in the situation

of these Northwestern States to day, and that of Wisconsin and Minnesota in a like stage of their timber development, namely, the great national forests occupying the greater part of our mountainous country, which will not only serve as an example of practical conservation, but furnish a very considerable source of permanent timber supply around which, and modeled on which, we can maintain our large private holdings of the future.

While these foregoing paragraphs may seem quite a digression from my subject, they are necessary to an intelligent understanding of the field in which the labor of the future logging engineer is to be spent. It is so easy for the young forester, fresh from his studies of the latest and most advanced methods, to make the mistake of condemning local methods before fully understanding the underlying principles and conditions which may justify these seemingly incorrect and wasteful ways of going at things. Let him first ask himself "Why," and after thoroughly threshing it out he will be in a better position to suggest changes.

First and foremost, you must specialize on the importance of the logging railroad. The railroad is the main artery of the modern logging plant, and, aside from the timber itself, it is the most important consideration in planning for a logging operation.

Under this head comes your topography taken in connection with a thorough reconnaissance of the entire tract. You will have very little use for triangulation or traverse methods in this first preliminary examination. The general mapping will be done by pacing and the use of the aneroid, with checks on the section and quarter section corners. All section lines should be run out and reblazed and the mapping done by the contour method using from 20 to 50 foot contours, depending on the relief of the country, and accuracy required.



SIMPSON LOGGING CO.'S BRIDGE IN CONSTRUCTION STAGE. BEGINNING OF FOOT-HILLS OF THE OLYMPICS.

Once you get your country mapped you have a splendid basis from which to work on the preliminary reconnaissance for the railroads. It usually pays well to go over as closely as possible the route to be taken by the road and get thoroughly familiar with the topographic details that will control the future road. For instance, suppose, after you have gone a mile or so, following a tentative grade of, say 2 per cent, you will find that by increasing your grade one-half foot to the hundred you can gain a bench, which will give much lighter construction for a considerable distance. This will be a vital control in the laying out of the road, either necessitating an increase in grade, or a new starting point for your climb. In general, the whole line must be laid out in reference to the points of chief difficulty or where the greatest saving can be made in cost of construction without impairing the value of the road as an outlet for the timber. The latter point is one which must never be lost sight of.

You must thoroughly understand logging to successfully construct logging roads. It is just here that the contracting surveyor or engineer falls down. His ideal is the road itself. Yours must be the logging operation as a whole. Your cost must be governed by the amount of timber to come over the road and the probable expense of logging it. When possibly you will want to limit yourself to a 16-degree curve and a 3 per cent grade on main lines, but quite often you will have to depart from these limits and will be entirely justified in doing so.

Having threshed out the main line, you are ready for the preliminary survey, and I want to say right here that out in this country the day when railroads could be laid out by eye, and with curves run in with a tape, is past. It is real railroad engineering; a transit should be used on main lines, while a good compass and hand level will serve very well for the spurs. You must be able to give a pretty close estimate on each mile of proposed construction



STEAM SHOVEL AT WORK ON NEW EXTENSION, SIMPSON LOGGING CO.'S R. R. AT SHELTON, WASH. CONSTRUCTION OUTFIT OWNED AND OPERATED BY THE LOGGING COMPANY.

from cross sections of the excavations and fills, including drains, culverts, trestles, bridges and equipment. We have a number of logging bridges over 100 feet high and from 600 to 1,000 feet long in this State and every year as the logging gets further back into the foothills, the longer and more permanent are the main lines of the logging railroads.

You may find several preliminary "fly lines" necessary in the very difficult places before the final location can be determined. The preliminary lines are platted in the office, usually by "latitudes and departures," and from your cross section topography, the final location can be sketched in, subject to further changes on the ground, if necessary.

The spurs are laid out much in the same manner, economy, however, being the main consideration. You can afford to haul over a 6 per cent grade and 32 degree curve for a few months on

spurs where two or three loads can be switched out at a time. In most instances a light locomotive, geared or direct connected, is kept especially for switching from the landings on the spurs to the main line side track.

Then there is the maintenance to be supervised, and a close watch kept on construction. At the end of each year you will have a detailed report on the railroad work, cost of engineering, construction and maintenance, cost per M. for timber coming out over each spur, and cost per M. over the main line.

Another duty will be the laying out of pole and skid roads when necessary. Together with the spur work this should be done with the co-operation and help of the logging foreman. Your idea must always be to facilitate his work in the actual logging operation as much as possible, and you must be aware of his future plans, governing your work accordingly.

As a general rule you will co-operate with the foreman and superintendent in



BRIDGE OVER WEST FORK OF TATSOP RIVER, 130 FEET ABOVE THE RIVER. WITHIN ONE MILE ON THIS SAME ROAD IS THE TWIN OF THE BRIDGE. IT IS ESTIMATED THAT THE LAST $1\frac{1}{2}$ MILES OF THIS ROAD, INCLUDING THESE BRIDGES, COST NEARLY \$100,000 TO PUT INTO OPERATION. IT IS STRICTLY A LOGGING ROAD. SIMPSON LOGGING CO., SHELTON, WASH.

selecting camp sites and in locating landings. At the landing there should be enough grade toward the main track to drop the loaded cars by gravity and yet not too much grade, as that would make this proceeding dangerous. It is very easy to let a loaded car get away on a grade, and even where proper precautions are taken as to safety switches and derailing devices a great deal of damage may be done by such a run away.

While much more might be said on this subject, to go into further detail would more likely prove confusing rather than enlightening. So I will proceed to other phases of the work with which you will probably come in contact.

Perhaps, next to the purely engineering side of your work will come fire protection. It is quite true that the greater part of this country is patrolled more or less thoroughly by one of the

fire protective associations. But in nearly every instance the effectiveness of their patrol depends almost entirely on the co-operation of the logging companies. And nine times out of ten the actual handling of any fire on your lands will devolve on you. Hence, the necessity of adequate preventative measures, such as the burning of slash, clearing up of the railroad right of way, construction of fire trails, and organization of the logging force so that at a moment's notice it may be converted into an efficient fire fighting body with proper equipment, ready for use. In this one particular alone the logging companies of this section have perhaps more room for improvement than in any other branch of their organization. I sincerely believe that enough property, camps, logs, donkey sleds, etc., together with the often misplaced energies of a typical logging crew fighting fire, would fully meet the expense

of such an organization for fire protection within a short period of years, not to mention the practical insurance against loss from fire that such systemization would constitute.

The timber end of the work is by no means unimportant. There will be quite a large amount of cruising and scaling to do, and I wish to state most emphatically that a man new to this country needs several years experience in timber before he can constitute himself a competent judge. Different localities have their own characteristics: in mixture of species, variations of growth conditions, marketability and special conditions, such as the prevalence of pin-knots, pitch-pockets or coach.

Any questions of subdivision or sections or of trespass will come under your duties. The accurate scaling of trespass from the stumps is quite an art of itself, and many of the larger timber holders employ men who give practically their whole time to watching for trespass.

At the close of each year's work, in connection with the railroad report would be a report on the year's logging, showing the area cut by each camp, the average yield per acre, and the average cost of logging per M by the month. Also the cost of timber left on fractional forties. This would give the owners of the company an idea of how their cruises were panning out and how much timber was still left tributary to the camps in their present location.

Another problem you will want to be up on is the final utilization of the logged over lands. Will it pay to reforest? If so, what method will be best suited to the land in question? If not, what will it cost to clear and subdivide into small farms? Can you successfully clear by the charpit method, or will it have to be done with dynamite and a donkey engine. In short, the question of our logged off lands is as important to this section of the country as is irrigation to the arid lands of the West or the drainage of swamp lands to the South, and the man who can present and work out a satisfactory solution

to this problem is going to be one of the "big" men of this section. And it is by no means an unsolvable question.

I have laid out townsite additions and drafted plans for a hospital; estimated power generated by our mountain streams and surveyed mining claims. In fact, the diversity of the work and the continual game of working out new problems (for no two logging propositions require the same treatment) is one of the biggest attractions in this sort of work. And it takes a good man and a versatile man to succeed. There is not a large logging company in the country that does not need such a man. They may not all realize their need, but it is there just the same. And there is no better training in the world for a first class woods superintendent. Add to that the fact that really "A Number One" woods superintendents are not readily picked up these days and you have the ultimate answer. Make yourself valuable enough to your company to demand an interest or else have the ability and knowledge to put in with capital in the development of an operation of your own.

This does not sound much like forestry, does it? But after all, what is forestry but scientific management and operation of timber lands? And if State laws and local market conditions make it impossible to either hold your timber or to utilize it completely, is it not good forestry to operate to the best possible advantage under present conditions and in the meantime try to better the conditions? Of course we can better our methods now, and year by year in the future, but we cannot do it all at once, and the more technical men who become associated with the actual logging and manufacture of timber, who will work toward the end of practical conservation, the sooner we are going to get such conservation. And who can foretell what the next two decades will bring forth in the line of real forestry. I for one will not be surprised to see large companies in this western country who, operating under wise tax and fire protection laws, will



DOUGLAS FIR LOG, TEN FEET SIX INCHES INSIDE BARK. LOGGED AT CAMP 5, TWIN FALLS LOGGING CO., CLARK COUNTY, WASHINGTON.

own tracts large enough to give their mills a perpetual supply of logs. And when that time comes, it will be the forester working from the inside of the actual operation who will know best what may and may not be attempted.

But it means work and more than that—drudgery, especially to a college graduate whose pride is going to be hurt more than once while he is doing subordinate work, often under men who, lacking education, affect to look upon any one who has been a “college boy” as no good when it comes to real work. You will often find yourself regarded as a failure simply because you

are working up in a big business; and that by men who have had some one to pull and push a bit for them when they started on their business career. I thoroughly believe that this is one business that has to be learned by actually getting in and working at the various subordinate jobs that go to make up the whole of a really big business. Our best loggers are men who have worked since they were boys, and they will tell you that they are always learning some new wrinkle. I know from experience that this is very true. No two logging companies operate under the same principles; some have a good selling organ-

ization and fall down on the actual logging; others have a splendid railroad system and do not seem to get the logs; one man is logging small timber, another large timber, one in ragged country, another on comparatively level land. Everywhere you turn there is something different and there is no business in the world where the individual efforts of the superintendent or manager count for more in the general result attained.

There will be many times when you will ask yourself whether or not you have made a mistake after all in taking up private rather than Government or State work. You see your classmates going ahead more rapidly at the start than you can hope to do. They receive more money to start with and are promoted more rapidly the first year or so; and here is the biggest question of all; they are doing more technical work, are using their education, while you are way back in the primary grade again learning your "A, B, C's" of the business. This is the hardest rub of all and I believe it influences more men to go into the Government service than any other one thing. But just wait a

little longer and I'll tell you about the rewards, as I begin to see them. Whenever I began to get discouraged during the first few years I used to remember the words of a man who had done both private and government work, and who knew what he was talking about. He said, "Ten years may seem a long time to a young fellow, but to a big corporation, training men for the work of a life time, it is but a short and necessary period of preparation." Now I do not expect to have to put in ten years of drudgery. I can begin to see the end of it now. Why? Simply because I am getting to know the business from the ground up and I know that I know it. This knowledge is going to be capitalized before long and it is worth just what I have spent on it. And meanwhile, I have made a living for myself and family; not much, but enough. I have good friends and the respect of those with whom I am thrown in contact. And I would not trade my chances for the future with any one of those who entered the business handicap at the same time and with the same equipment I had.

STATE FIGHT ON TREE PESTS

ABOUT four weeks, starting May 13, is being devoted by Pennsylvania to demonstrating methods for the control of the codling moth, curculio and other insect pests which have started to get busy on the fruit trees which are in blossom.

Dr. H. A. Surface, the State's zoologist, says that the demonstrations will be held in twenty counties the first week and in thirty-five counties the second, the northern counties being in the third week, as the time to demonstrate the methods for control of the pests is just after the petals of the blossoms fall.

"Several meetings are to be held in

each county," says the zoologist. "This is so that everyone will get a chance to see the demonstrations which will be in charge of our best men. This is the time to get after the codling moth, the chewing insects and pests which are now infesting trees in some parts of the State or are likely to develop. Pennsylvania has advanced the value of its fruit crop wonderfully by using scientific methods in the combating tree pests, and it is believed that as soon as fruit tree owners realize the possibility of reducing the number of culls or unsound fruit from ten per cent to two per cent. I think there will be still greater gains."

FOREST CONDITIONS IN WESTERN NORTH CAROLINA

By J. S. HOLMES
Forester

IT IS probable that Western North Carolina is more widely known for its fine climate, pure water, and beautiful scenery than for any others of its natural advantages. Thousands of health and pleasure seekers come each winter to this "Land of the Sky" to escape the rigors of the northern and eastern states, while tens of thousands flock each summer from the south. The entertainment of these summer and winter visitors or tourists forms a most important and promising industry, for they bring into the country each year from two and a half to three million dollars. The large part that the forests play in the tourist traffic, by increasing the purity of the streams and making the country more beautiful and interesting, is not generally realized; yet forest and stream and climate are Western North Carolina's most valuable assets. With the conservation of the forests, the improvement of the roads, and the extension of railroads, the attractiveness as well as the accessibility of the country will be tremendously enhanced, and the number of visitors will steadily increase.

Of even greater economic importance are the timber resources. The hardwoods of the Southern Appalachians are as widely known among buyers and users of wood products as the climatic advantages are by the traveling public. Oak, chestnut, poplar, cherry, walnut, and other woods are shipped to all of the eastern states, even to Canada and to Europe; and furniture made in North Carolina from wood grown in these mountains goes all over the world.

Agriculture, which in most parts of the State stands first among the important industries, takes third place in the mountains, and, if only those farm products which bring a cash return are counted, is unimportant, though considerable quantities of apples and cabbages are shipped out of the region,

and corn, cattle, chickens, eggs, butter, fruit, and garden truck are sold locally.

ACCESSIBILITY OF THE TIMBER.

The accessibility of timber largely determines its value and also determines methods of forest management.

Western North Carolina is well supplied with railroads, there being no fewer than ten railroad outlets. Yet the greater part of the best timber is remote from transportation and cannot be marketed profitably until new lines are built or extensions made. Since 1909, however, railroad development has been rapid, so that now only the three extreme northeastern counties are without railroads, while spurs or extensions are under construction or are definitely planned for about half the mountain counties. The wagon roads, which are the chief feeders for the railroads, are in most cases unimproved; and though they are often fairly good in dry summer weather, many of them become almost impassable in winter. Nothing could add more to the value of timber and give proper encouragement to proper methods of forestry than the construction of good roads. This question of transportation is discussed in more detail later.

CLASSIFICATION OF LAND

Throughout the region, agricultural land is held mostly in small areas, and a farm of more than 500 acres is exceptional. In nearly all counties, however, some forest land is held in large bodies by lumber companies, or speculators; and in some counties more than 60 per cent of the land is in tracts of more than 1,000 acres in extent. But since all of this is rough, mountain woodland, unsuited to agriculture, such tenure is no drawback, but rather an advantage; for by keeping the full stand of timber the land retains a full valuation, which is reduced as soon as the timber is taken off.



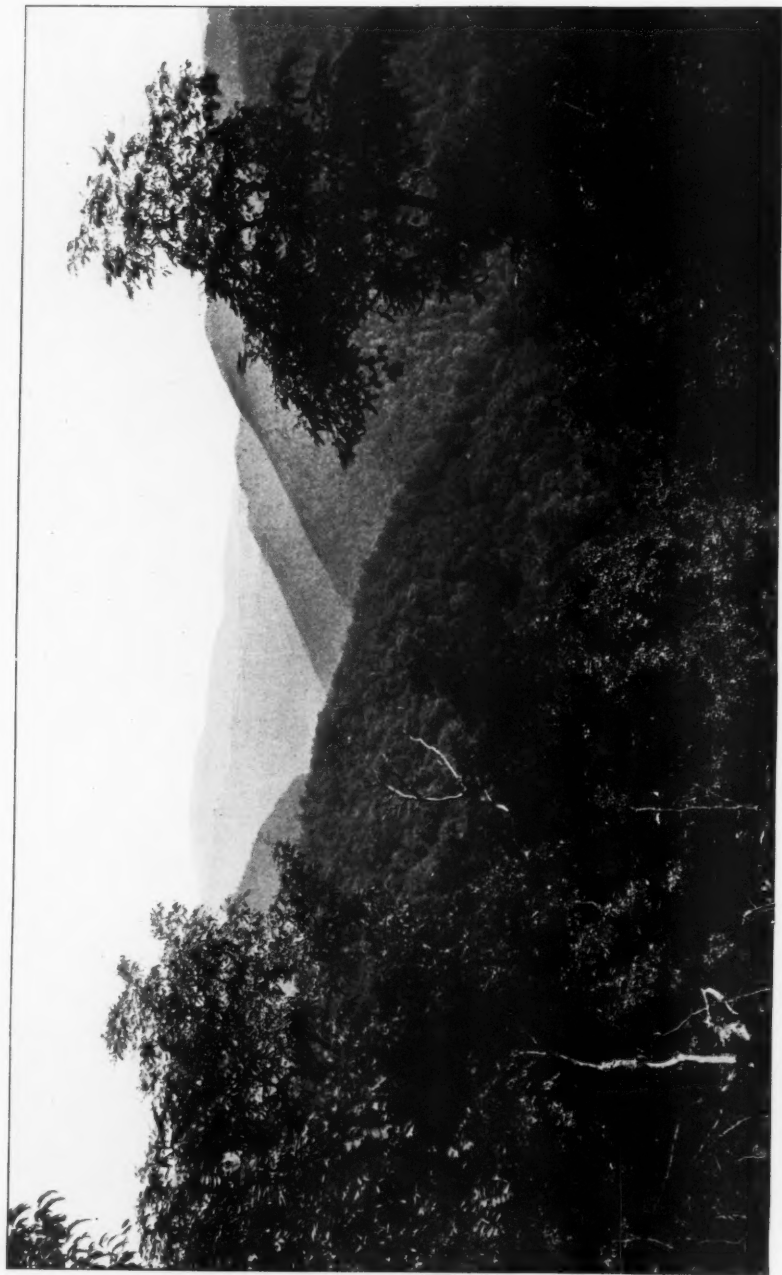
LOGGING WHITE PINE AND HEMLOCK, MITCHELL COUNTY.

The proportion of cleared to forested land varies considerably in the different counties, depending on the transportation facilities and suitability for farming. In the region as a whole about 24 per cent of the land has at one time been cleared. While most of this land still produces agricultural crops, a good deal of it in some counties has been "thrown out," or abandoned, because it is too poor and too much washed for profitable cultivation. Such land usually produces worthless briars and bushes or in some cases reverts to a scattered growth of oldfield pine or hardwood of little present or prospective value.

THE FOREST CONDITIONS

The forests of this region are largely confined to absolute forest land, that is, land potentially more valuable for forest growth than for anything else. The forest may best serve for the production of timber, or it may be required

mainly to prevent erosion or to protect and regulate a water supply. In the main, the mountains are so steep and the soil is so shallow that the removal of the forest cover and the cultivation of the land are followed in a comparatively few years by the washing away of the fine surface soil and the abandonment of the land for agricultural purposes. Not only have practically all of the areas suitable for agriculture been cleared—including the bottoms along the streams, gently rolling plateau land and hilltops, the lower gradual slopes, and the mountain cover—but much absolute forest land has also been cleared. It used to be that farmers cleared a "new ground" each year, and abandoned to "old fields" an equivalent of "worn out" land. This practice is now giving place to improved methods by which the cleared land is kept in good condition. Though much land has been cleared for agri-



TYPICAL HARDWOOD FOREST OF WESTERN NORTH CAROLINA. VIEW FROM HUGHES' RIDGE, SWAIN COUNTY.



BINDING POPLAR BOARDS FOR EXPORT, SWAIN COUNTY.

culture, some of which is now reverting to forest, 76 per cent of this region is forested, or a little more than three million acres in the 16 counties.

PRESENT STAND

The greater part of the forest has been reduced to cull stands of comparatively small and second class timber. Only two or three counties have virgin forests of any considerable extent, and these are mostly controlled by large lumber firms. Table 1 shows the relative amount of forest in each county, by areas and by species. About eleven billion feet of timber in trees 10 inches and over in diameter breasthigh remains; this is equivalent to an average stand of a little more than 3,000 board feet for every acre of forest land. The larger part of the forested area, however, has less than this, as shown on the accompanying forest map.

ANNUAL OUTPUT

The lumber cut for the entire State, which had been gradually rising, amounted to more than 1,622 million feet in 1907, but because of business de-

pression declined 30 per cent in 1908. In 1909 North Carolina jumped to fourth place, from thirteenth in 1908, with a cut of 2,177,715,000 board feet.

It is estimated that uncared-for hardwood forests, such as those in Western North Carolina, are growing at the rate of from 12 to 15 cubic feet per acre per year. Assuming even that the greater figure represents the annual growth in this region, then the timber is being cut much faster than it is growing. This can not last indefinitely. Either the annual cut must be reduced to coincide with the growth, or else the growth must be made to keep pace with the demands upon it. The latter is certainly the most economical and businesslike way of dealing with the problem. By protecting these forests from fire, and by encouraging the more rapid-growing and more valuable species, the annual yield of timber per acre can be largely increased in a comparatively short time. The large furniture and related industries in Piedmont, North Carolina, which now draw the greater part of their timber supplies from the region in which they are situated, will



THRIFTY GROWTH OF BALSAM PLANTATION, AT ELEVATION OF 3,800 FEET, WATAUGA COUNTY.

depend more and more on the mountain forests. The demand for this material, aided by improved transportation facilities and methods of manufacture, should make it evident that the establishment of a maximum timber yield would constitute one of the most important contributions which the mountain counties could make toward the economic development of the State as a whole.

FOREST DISTRIBUTION BY TYPES

The forests of Western North Carolina are a part of the great Appalachian hardwood region, which extends from southern New England to the mountainous portions of northern Georgia and Alabama. These forests differ from those of the central hardwood region, into which they gradually merge beyond the western border of this State, in their possession of several important species which do not grow beyond the mountains, or grow in very small quantities. Such species as chestnut, red oak, hemlock, and white pine form a large proportion of the Appalachian forests, and scarcely appear in those of the central hardwood region.

There are two distinct classes of forests in this region; the spruce forest on

the tops of the highest mountains, and the hardwood forest, either pure or associated with pine. On some mountain slopes hemlock grows in almost pure stands, and some old fields at the lower elevations have grown up to pure or mixed stands of pine; with these exceptions the hardwood stand covers the whole area.

SPRUCE FOREST

The spruce forest grows only on the tops and upper slopes of the high mountains, and rarely below an average elevation of 5,500 feet. This forest is an extension of the great spruce forest of the North, which seeks increasingly higher altitudes as it extends south, and reaches its southern limit on the western shoulders of Clingman's Dome, a peak 6,600 feet high, in Swain County. The largest spruce areas in this region, as will be seen by the map, occur in Swain, Jackson, Haywood, Yancey and Mitchell counties. The distribution of the type is dependent not only upon elevation but also upon moisture conditions and to a large extent on protection from storms by the surrounding mountain peaks. The type extends down only a short distance on the southern slopes of even



MATURE SPRUCE FOREST SHOWING ADEQUATE REPRODUCTION.



MATURE SPRUCE FOREST BURNT OVER AND DESTROYED TWELVE YEARS AGO.



SPRUCE PULPWOOD, FROM FLUME TO CARS.



CHESTNUT EXTRACT WOOD IN YARD OF CHEROKEE TANNING EXTRACT CO., ANDREWS.



UNLOADING BARK FROM CARS AND STORING IN SHED.

the highest mountains, but along northerly ridges and slopes it sometimes descends to 4,500 feet.

The stand of spruce and balsam averages from 15 to 25 thousand feet an acre over the whole area covered by this type, and many stands will cut from 40 to 50 thousand feet to the acre. Where this timber is being cut for pulp wood from 40 to 50 cords per acre is an average yield. Spruce varies in height from 40 to 50 feet on the ridges to 80 or 90 feet on the north slopes and in the heads of coves, where it attains a diameter of three feet. Balsam is smaller and is rarely more than two feet in diameter.

In the mature forest reproduction is good, owing to the very favorable moisture conditions and the freedom from fire. In dense stands there is a larger percentage of balsam, but where the forest is more open spruce reproduction is favored. On areas that have been cut over and not burnt, the young growth which had started before cutting continues to thrive, and on many areas seedlings of both species have started since cutting. Unfortunately, no very heavy cuttings could be studied, since logging for pulp wood has been carried on for only two or three years. Both spruce and balsam need moist humus for successful reproduction, and

where fire recurs after cutting neither of these species will be perpetuated. The abundant rainfall, which is heavier on these mountain tops than anywhere else in the State, assisted by the dense shade of these evergreen trees, affords an efficient fire protection for spruce forests while they remain largely in their natural state. But when the trees are removed, allowing the large amount of vegetable matter on the soil and the tree tops left in logging to become dry, fires burn through the remaining timber with disastrous results. The current belief is that it is impossible to keep fires out of this type after logging, and that then these forests will disappear. If fires can not be kept out, this will certainly be the case, and all this type, amounting to some 100,000 to 150,000 acres of splendid forest land, will very rapidly become barren mountain tops. On certain areas that have already been cut and accidentally burned, grass has been sown, the owners claiming that the land will pay better in pasture than in timber. There are, however, only limited areas that are suitable for pasture, and most of the land is so steep and so rocky that once the dense forest cover is destroyed the soil will soon wash away and leave only the bare rocks. In the opinion of well-informed men, if this happens the land will event-



A LARGE CROP. STACKING SURPLUS BARK IN THE OPEN.

ually revert to the State for unpaid taxes.

The hardwood forests, which occupy all but the highest peaks, vary considerably, according to soil, aspect and elevation. They can be separated into four important types: plateau, chestnut, red oak, beech and maple.

THE TIMBER INDUSTRIES

Practically all of the timber cut in Western North Carolina is sawed or

otherwise manufactured in that part of the State; little is shipped out in the log. Two-fifths of all the timber cut for sale is manufactured into lumber; but the greater part of this is shipped out of the region.

Except for agriculture, almost all of the products of which are consumed locally, lumbering is by far the most important industry. In 1909 about 185,000,000 feet of lumber brought a money return of nearly \$3,000,000.

INCREASE FOR NEW HAMPSHIRE

State Forester Edgar C. Hirst has been notified by the forestry department in Washington that the government will again this year co-operate with the State authorities in protecting the forest lands of the north country from damage or destruction by fire, and that the sum of \$8,000 has been allotted to the State, as against \$7,200 last year.

REFORESTATION STARTED

The board of water commissioners of Massachusetts decided to undertake the experiment of reforestation of the Little river and Ludlow watersheds, and in pursuance of that idea voted to buy 10,000 young pine trees for planting on the two watersheds. The work will be started within two or three weeks, 5,000 of the trees being set out on each watershed.

TREES OF INDIANA

The Indiana State Board of Forestry, in response to a demand from teachers, pupils, landowners and millmen for information on the trees of Indiana and their uses, have devoted the greater part of their 1911 report, which has just been published, to this subject. This report illustrates each species of forest trees of the State, with a full-page drawing, and gives a detailed botanical description of each species with its distribution in the State. The economic uses of the different kinds of wood are given, together with a table showing the comparative weight of the different woods. The horticultural and forestal values of many species are discussed in detail, and information is given as to the best kind of trees to plant for ornamental and forestal purposes.

A LUCKY CHANCE ASSIGNMENT

By WALTER J. MORRILL

IN the summer of 1908 we were worn out with forest fires on the Pike. They came in bunches. One of the worst was on Elk Creek.

A new guard, Joseph E. Smith, was the first to report it to our headquarters in Denver. He had frazzled nerves acquired in his capacity as city editor on a Denver paper, which was fighting us at that time. He needed outdoor employment for a season, and we sorely needed on that newspaper staff some one with a little first-hand knowledge. Moreover, few were applying for positions. He was a good fellow, the acme of urbanity, and the quadruple extract of politeness. Yet we thought it wise to fill his days with arduous labor, while we trusted that his natural instinct would lead him to employ his evenings in literary work. Accordingly, he was assigned a reasonably long patrol in dry weather, and on rainy days he was given a trail to build. His principal equipment consisted of an ax, shovel, and a quantity of yellow scratch paper.

Within a few days there came from him a long distance message: "A horrible big fire on Elk Creek." Was this some newspaper scare line stuff? I left for Baily's on the next train; recruited all the available native force; took another glance at the billowing smoke 12 miles north, and telephoned the Supervisor for 30 men from the Denver.

We fought against odds that night. It seemed at first as fruitless as old King Canute's endeavor to stop the ocean tide, but finally we held the line on one side. Then help came, and with it two Forest Assistants to serve as my lieutenants. Two more days of running in and holding the fire followed. By this time the editor-guard was exhausted. He had served well as a mounted aid to carry messages from different portions of our front. We now had the fight well in hand.

It occurred to me to assign the guard to the comparatively easy task of scouting the district from a divide. It was possible that other fires might start in distant places in that wild region. In the forenoon he set out with a young ranchman on this seemingly unimportant mission. The divide was two miles or more to the right of our surrounding fire; its ascent was rough.

An hour later the unexpected, the disastrous thing happened. The wind shifted and became rapidly stronger until it was violent. Smouldering snags burst into flames; embers carried across our north line. After one low branching spruce had flared with a roar, and then another, soon a crown fire was racing up the gulch, preceded by swiftly flowing low clouds of dingy smoke. Up the canyon the flames ascended with incredible speed, as fire sweeps up a soot-filled smoke stack or the chimney of a foundry. Since the guard and the ranchman should be well on their way, perhaps they could reach timber line. So we rearranged our forces on each side of the canyon along the high walls. We could not head it. Valuable timber on either side stretched away for miles. The gulch must burn, but we hoped to confine the fire to it.

I felt no small anxiety concerning the two men. Occasionally I ascended to a rocky point, but at no time did I see them. Nor was it likely that I could, since the distance was considerable, and at times the smoke obscured. I looked nervously for smoke columns on the other side of the divide, although I doubted whether brands could carry to the adjoining watershed.

A sleepless night of worry and patrol inspection followed. My thoughts dwelt upon the task that I feared would be mine on the morrow, when the gulch could be traveled. Daylight came, and I went to camp. The night men had come in for a few hours'

sleep. Nobody had seen the missing men. My fears seemed realized. Little was said, and a funereal atmosphere prevailed.

Could I believe my bloodshot eyes! Yes, there were the guard and the ranchman, black-faced like minstrels, crippled like old stage horses, struggling into camp. The case-hardened old reprobates of my cursing, tired, faithful crew from the "lower precincts" broke into a spontaneous cheer. A lump obstructed my throat, and I merely grasped the two by their hands and led them to the camp stove for their coffee.

The guard finally recounted their experiences. First the eddying smoke and the increasing wind had aroused their apprehension. Then the roar of the oncoming crown fire had spurred them forward. As the walls of the canyon did not permit of escape to either side, their only chance lay in gaining timber line ahead, a distance only vaguely known by either. Up they clambered. A sense of anxiety soon took the place of the first spirit of adventure, as violent exertion brought them distress, and the smoke was increasingly irritating. Soon a louder roar and crackling convinced them that the fire was overtaking them. The way was steep and boulder strewn, the smoke choking. Fear urged them on. The red glared dully down the gulch through black smoke; the heat was already appreciable. Gasping, terrified, and exhausted they wildly, but more feebly, stumbled forward. The smoke was blinding them now. Flying embers and pieces of burning bark shot past them, and burned holes in their clothing. Then, when hope was all but gone, a bunch of scrub willow was in their path, and then another. Rank grass appeared. The ranchman shouted encouragement, for to his experienced eye these were evidences that timber line was gained. Now they were in dense, scrub willows that scarcely reached waist height. On and up they slowly faltered, but safe. Relaxation overcame them, and a nervous reaction caused them to jest about their

recent plight. But soon sprains and bruises, previously unnoticed, began to appeal. Thirst was parching their throats.

By brief advances they gained the crest. A lurid spectacle appeared below—a world afire. Embers still whirled past them. Could the flaming missiles possibly touch off the heavy spruce on the Bear Creek side? Duty demanded an immediate inquiry. Down the other side they painfully made their way. A tiny column of thin blue smoke greeted them here, and another there. Again they were running, their infirmities forgotten, but toward the fires. They beat out the flames here, only to find themselves more urgently needed elsewhere. With bleeding hands they scraped earth to throw on resin-filled, burning snags. Flames were curling up from the needle-littered forest floor, spreading like the ripples from a stone thrown into a placid lake. Sometimes it seemed that only two were no match for the insidious blazes. Once the ranchman fainted. He was dragged from danger and revived. Again the two men wrestled with odds against them. For hours they fought. It seemed to them their whole life time had been spent in fighting the flames. Burning thirst, physical and mental exhaustion were always present, but not one moment of respite.

Indomitable will and perseverance, however, were beginning to tell. No longer did the battle seem hopeless, for they were surely succeeding, and the prospects of victory inspired them to renewed exertions. The day passed, and night ushered in a calm. Finally one could hold the line of defense, yet with some danger, while the other went in search of water down the forest-clad slope, returned and relieved his companion. Hunger, faintness, and fatigue held vigil with the two as they made their incessant rounds, for no foe is so crafty as a forest fire.

Long after midnight, when all seemed secure, they painfully climbed the crest. Far down the canyon that they had traveled long, long ago there

gleamed a myriad of isolated fires, like camp fires of an army. But the fire zone was narrow. It was evident that the crew had held it to the canyon. Soon the pale gray of approaching dawn appeared over Meridian Hill. A little later they could safely trust themselves on the crags; and then came the

slow, weary march by a long detour to camp.

Thus ended the crisis in that fight, won by the two on a lucky chance assignment. And now no newspaper writer more ably defends the Service than the former guard. He has seen, and he knows.

FORESTS AND FLOOD PREVENTION

THE report of the United States Waterways Commission, recently made public, devotes ten pages to a review of the conflicting opinions, statements and reports upon the influence of forests upon navigation and flood prevention.

The Commission says that the officers of the Corps of Engineers and meteorologists are, as a rule, inclined to minimize the influence of forests upon rainfall and stream flow, while geologists, foresters and others are inclined to emphasize it and civilian engineers are about equally divided.

The Commission reviews the investigations made by Prof. Mead, of the University of Wisconsin, and those of Colonel Burr, of the Corps of Engineers, both of which showed that no particular variation in stream flow could be traced to the large changes in forest cover which have taken place in certain drainage basins. It also reviews the studies made by M. O. Leighton, of the Geological Survey, and Messrs. Hall and Maxwell, of the Forest Service, tending to show that a number of streams in the eastern United States were becoming more irregular in their flow. The Commission rejects all these records, however, as not finally settling the question.

The final conclusion reached by the Commission is that whatever influence forests may exert upon precipitation, run-off and erosion, it will evidently be greatest in mountainous regions. In no case, however, can forests be relied upon to prevent either floods or low-water conditions. There is substantial agreement of all the witnesses on this point.

The prevention of erosion undoubtedly outweighs all other benefits of forestation, and the Commission favors the prevention of forest removal on mountain slopes wherever the land is unsuitable for agricultural purposes. It urges the reforestation of tracts which have already been stripped of timber, not only when located at the headwaters of navigable streams, but wherever this would be the most valuable use of the land.

Of at least equal importance with forest preservation are the prevention of forest fires, the regulation of hillside farming, and prohibition of stripping the forest cover on mountain sides where the soil cover is thin. The Commission concludes that the chief responsibility for forest preservation and protection of lands from erosion rests with the separate States rather than with the Federal Government.

CITIZENS INTERESTED

Secretary A. C. Carton, of the Michigan public domain commission, says that correspondence he has had indicates that about four hundred citizens interested in various phases of conservation of public resources will attend a conference called to meet at the State capitol on June 12.

INSPECTION OF PLANTATIONS AND NURSERIES

WHEN you show a lumberman that the scientific replanting of denuded forest lands can be done at the rate of one cent a tree, planted from four to five feet apart; that the cost of proper fire protection is very small; that the trees planted can be thinned in twenty years at a profit, and that in from forty to fifty years the replanted section will be a valuable forest, he is likely to be impressed. Lumbermen, figuratively, are from Missouri. They are also intensely practical. They must be shown actual conditions, see the actual results.

This is what they did see when a number of them, all representative men, accompanied the directors and members of the American Forestry Association on a tour of inspection of the New York State nurseries and plantations at Lake Clear, Paul Smiths, and Saranac Lake on May 3. There, under the direction of Clifford R. Pettis, superintendent of state forests, they travelled over miles of replanted forest lands, and traversed acres of thriving nurseries, and what they saw and what they heard of the progress the State has made in the last ten years astonished them.

The first plantation made by the State in the Adirondacks was in the vicinity of Lake Clear Junction in the spring of 1902. About 600,000 trees were planted at that time, covering, approximately, 500 acres. No plantation was made in the spring of 1903, but the Ray Brook plantation was commenced that fall. The plantations are located at Lake Clear, near Saranac Lake, at Ray Brock, at Chubb Hill, near Lake Placid, and at Paul Smiths. Plantations are being made this year at Bensons Mines in St. Lawrence County; the Paul Smiths and Ray Brook plantations are being increased, another plantation is being made between Ray Brook and Saranac Lake, and one at Schroom Lake in Essex County. About 6,000 acres of State land have already been reforested.

Now as to what has been accomplished toward helping private owners of forest lands. During the past four years the state has made over 1,500 shipments of trees to private land owners who have purchased the stock to reforest their own lands. This spring the sales approximated four million trees. The state is also giving trees to the various state institutions for reforesting their lands.

As to the nurseries and their developments, the first Adirondack nursery was established at Saranac Lake in 1903. That nursery has been greatly increased in size, and in 1906 a forest experiment station was established in co-operation with the Forest Service, and various experiments were conducted and nursery practice studied. Since that time two nurseries have been established near Lake Clear Junction, one at Salamanca, one at Saratoga, and one is now being built at Comstock, at which place convict labor is being used.

The American Forestry Association party gathered at Paul Smiths on the morning of May 3, and after a delightful breakfast, for which the keen mountain air gave a decided appetite, the party drove to a series of extensive plantations. These plantations were of particular interest because they represent a complete series of experimental plantings by seed spot methods, direct seeding, and the use of nursery transplants, and also include a large variety of species. The broadcast sowing of white pine, for example, seems to promise ultimate success, although at present the stand is not as uniform as from planted trees. The seed spot method showed a great variation in results, due partly to damage by mice and squirrels. Even where good germination had been secured in the seed spots, one drawback appeared in that a little group of seedlings had to be thinned out and the extras used for filling in blank spaces, which adds materially to the expense.

Of the various species tried, Scotch

pine, Norway spruce, and strangely enough, western yellow pine showed the best results, Douglas fir and Colorado blue spruce being almost a total failure. Near the seed spot planting an extensive flat, which, according to local history, had been open land for probably over fifty years, although still showing evidences of an original stand of white pine, offered an interesting lesson as to the influence of soil on the growth of seedlings. This particular flat is of a sandy nature, probably underlain with clay or hardpan, producing conditions so unfavorable to tree growth that, although the plantation had been once replanted, the trees were not in a vigorous condition and were making very slow growth. The ultimate success in the planting of heath lands in Europe leads to the conclusion that the trees will eventually become established in this poor Adirondack land. On the slopes in the same region the growth of planted trees is very vigorous, and many of them show a height growth of one to two or more feet annually.

In the afternoon the party visited the plantations near Lake Clear Junction, which were established ten years ago, and found a solid forest of fast-growing Scotch and white pine from ten to fifteen feet high, covering land which for years before had been a barren, burned-over waste. The Adirondack nurseries of the State were visited during the same afternoon, and the various operations from seed planting to transplanting were seen.

The action of the American Forestry Association in inaugurating educational trips of this kind is a distinct feature, and the fact that within a night's ride of New York City can be seen as extensive nursery and planting operations as can be found anywhere in Europe is an indication that some of our waste lands at least will be reforested. The most striking lesson, however, and one particularly apparent to those who have followed the developments in New York State for ten years, is that in this comparatively short period the at-

titude of the lumbermen, State officials, and of the public generally is absolutely changed. Ten years ago, when the first planting was done by the State and the nursery work was started, the whole scheme was subject to more or less ridicule. Ten years later we find some of the largest lumbermen in the East accompanying an educational party of this kind and studying with the greatest interest the methods of nursery practice and planting in vogue. Not only this, but several companies have in the meantime inaugurated work upon their own lands, specific cases being the International Paper Company, which is planting at the rate of 500,000 trees a year; the Union Bag Company, which has also been setting out young forest trees extensively; and the Brooklyn Cooperage Company, which is planting about 100,000 trees per year. There is no prophet who can foretell what the next ten years will bring forth; but if our legislatures will give us equitable forest tax laws and the fire problem comes under a fair measure of control, it is not a vain hope that the lumbermen, in addition to replanting, will be managing some of their properties on a long-time basis and cutting under methods which will insure natural regeneration instead of denudation, which has to be followed by artificial reproduction.

In the party were: Chester W. Lyman, International Paper Company, N. Y.; C. F. Quincy, President Q. & C. Co., N. Y.; E. A. Sterling, Forest and Timber Engineer, Philadelphia; C. H. Griffing, International Paper Company, N. Y.; J. W. Toumey, Director Yale Forest School, New Haven, Conn.; J. Randall Williams, wholesale lumberman, Phila.; W. D. Clark, Penn State College, State College, Pa.; Warren H. Miller, Camp Fire Club, Editor Field and Stream, N. Y.; R. M. Parker, Pres. Brooklyn Cooperage Co., N. Y.; P. S. Ridsdale, Executive Secretary, American Forestry Association, Washington, D. C.; C. F. Moore, Editor "Paper," N. Y.; John M. French, Editor Paper Trade Journal, N. Y.; F. W. Kelsey, Nurseryman, N. Y.;

Otto Luebker, Vice President American Audit Company, Washington, D. C.; C. R. Pettis, Supt. State Forests, Albany, N. Y.; M. H. Hoover, Chief Publicity Bureau, N. Y. Conservation Commission, Albany, N. Y.; Hugh P. Baker, Director N. Y. State College of Forestry at Syracuse University; F. F. Moon, Professor of Forestry, Massachusetts Agricultural College,

Amherst, Mass.; Walter Mulford, Director Department of Forestry, Cornell University; A. E. Edgcomb, Lumberman, Knoxville, Pa.; W. L. Sykes, Pres. Emporium Lumber Co., Buffalo, N. Y.; C. H. Sisson, A. H. Sherman Lumber Co., Potsdam, N. Y.; James L. Jacobs, Supt. Santa Clara Lumber Co.; and George A. McCoy, International Paper Company.

LUMBER MANUFACTURERS MEET

DELEGATES to the National Lumber Manufacturers' Association convention held a very enthusiastic and interesting meeting at Cincinnati on May 7 and 8, and among other things decided upon an aggressive policy for informing legislators and the public of the truth regarding the lumber industry, endorsed the work of the American Forestry Association and urged the members of its affiliated organizations to join the Association.

The resolutions asked for an amendment to the Sherman Anti-trust Law by which it will be possible for associations and combinations of lumber dealers of this country to compete on a fair basis with lumber corporations of other countries. They also asked Congress to permit the free passage of the Panama Canal to American vessels engaged in coastwise trade, for the purpose of encouraging American shipping and trade. Legislation providing for prompt measures of relief and protection from the Mississippi floods was urged, as also was legislation preventing the importation of nursery stock except under direct and full control of the Agricultural Department. Placing the diplomatic and consular service under civil service regulations was advocated and it was decided to oppose the Interstate Commerce Commission in its effort to surround milling-in-transit and concentration rates with so many restrictions as to make them of no practical use to lumber and box manufacturers. It was also decided to join the

Chamber of Commerce of the United States. The Association expressed its gratification at the exoneration of Edward Hines, James T. Barber and his associates, and Frank W. Gilchrist from the charges brought against them.

President E. A. Griggs presided and addresses were made by W. E. DeLaney, president of the Hardwood Mfgs. Asso.; F. E. Parker, president of the National Wholesale Lumber Dealers' Association; Manager Leonard Bronson; Hon. J. B. White, of Kansas City; R. A. Long, of Kansas City, Mo.; Paul E. Page, of Buckley, Wash.; R. M. Carrier, A. T. Gerrans; W. G. Collar, M. B. Nelson, all members of committees; Charles S. Keith, who spoke on the relation of the trust question to the lumber industry; R. S. Kellogg of the Northern Hemlock and Hardwood Mfgs. Asso.; Horton Corwin, of the North Carolina Pine Association; Bruce Odell, of the Michigan Hardwood Mfgs. Asso.; Samuel J. Carpenter, of the Yellow Pine Mfgs. Asso.; Robert H. Downman, of the Southern Cypress Mfgs. Asso.; W. A. Cooper, of the Western Pine Mfgs. Asso.; George X. Wendling, for the Pacific Coast Sugar and White Pine Mfgs. Asso.; George H. Holt, of Chicago; J. J. Donovan, of Bellingham, Wash.; H. S. Betts, of the Forest Products Laboratory, Madison, Wis.; P. S. Ridsdale, of the American Forestry Association, and E. A. Sterling, president of the National Wood Preservers Association.

ARE THERE TOO MANY FOREST SCHOOLS?

By FREDERICK A. GAYLORD
New York State Forester

SINCE the start of Forestry education in this country, there has been raised a cry of too many forest schools. Some of the leading foresters in the country have done all in their power to keep the number of forest schools down as low as possible. Is this the proper sentiment? In my opinion it is an extremely poor policy and it is the purpose of this article to try and show why it is a poor policy.

Although I consider it one of the least important arguments for increasing the number of forest schools, let us first review the field of the forester, both present and future. Until 1911 the United States Forest Service was the chief market for trained foresters. By far the greater per cent of the men turned out went into the national work, a few, a very few, went into State work, a few more went in with lumber companies. Aside from these positions there was little chance to obtain employment.

In the future the U. S. Forest Service will never again be able to take in all eligible applicants and there will constantly be more and more men thrown in to other channels. The government, however, will always be an important source of employment as, with the increasing intensiveness of management, we will have an increase in the number of foresters employed per unit area. The government also will be heavily drawn upon by outside operators requiring foresters.

At the present time, outside of Pennsylvania, there are less than fifty scientifically trained foresters in State employ. In the near future the State of New York alone will employ that many and at least two-thirds of the other States of the Union will employ them in like proportion. It is only a question of time before the timber resources of New York are unlocked, and when this occurs fifty foresters will be a small number to look after the details

of State work. This may seem like a large figure, but after a sane consideration, realizing that there are 12,000,000 acres of forest land in the State (of which one-sixth is now under State ownership), and a population admitting of very intensive management, the handling of these lands alone, to say nothing of the nursery work, the education of the public, surveying, etc., which will have to be done, makes this figure really seem very small. There is a tendency at the present time to regulate private cuttings. Ultimately this regulation will have to come about and thus bring at least 8,000,000 acres under State supervision. I take New York as an example of what will happen in practically every other State in the Union.

WITH LUMBER COMPANIES

Until the present-day lumber companies have employed extremely few foresters. In the future this will be the great field for trained men. The lumbermen of the United States are primarily business men and they only need to be shown how they can make a dollar more in order to take up the idea. In the past, because of the time element, danger from forest fire, market conditions, etc., the lumbermen have been very slow to take a serious interest in forestry. The next decade will see a tremendous change in this direction and already some of the largest companies operating in the east have employed foresters and other companies are rapidly showing signs of awakening interest.

When the lumber companies do come to a full realization of the benefits and profits derived from a scientifically managed forest I firmly believe that there will be a demand made on the forest schools of the country proportionately equal to that made by the government in the last few years. The conditions are vastly different with the

profession of forestry than with a profession such as mechanical engineering. In the latter the demand for men had to be made by the mechanical engineers themselves, in other words, they built the business as they went along. With forestry we have this business already in operation to its maximum extent and it is a business second only in importance to that of agriculture.

A fourth great source of employment for foresters is to be in connection with water companies and other companies or individuals holding timber land for other purposes aside from lumbering. Here will be one of the best chances to practice proper management and show that the net income depends directly on the amount of the investment, as the financial gain from the management of such forests will not be the all-important consideration.

Water companies, the entire country over, are making a serious effort to gain control of their watersheds merely for protective purposes and the growing of timber is the only use consistent with this object to which such holdings can be put and companies are usually satisfied if the revenue returned will pay taxes, etc., and at the same time show improvement of their land. It will be only a few years before the importance of wood production will not fall far below the main object of such companies.

The country over, there are millions of acres held by private individuals who have only an aesthetic interest in their holdings. If the aesthetic value of these forests will not be destroyed, when such forests furnish an appreciable revenue, so much the better and foresters surely will manage all such estates at a not very distant day.

CITIES EMPLOY FORESTERS

Many of the cities, particularly in eastern United States, employ foresters. In the true sense of the word these men cannot be called foresters and yet there is no training except that of forester which would fit them for their duties. Where these men are employed, the satisfaction obtained is very marked

and every town of over 40,000 to 50,000 inhabitants can well afford to employ a forester, and the larger cities more than one and ultimately they will be brought to this. In this connection would come also the handling of large public parks, of which there are a great many throughout the country. Here, of course, financial return would not be considered and yet to properly administer such lands, a great deal of forestry knowledge would be needed.

The vocation of teaching will constantly make more and more of a drain on all branches of forestry practice. At the present time it is almost impossible to get efficient teachers to properly equip such schools as are in existence.

Another branch of forestry which has not been developed as yet is that of the management of communal forests. Just how much of a factor this will be is very uncertain, but that it will be a factor, to some extent, we are very sure. Legislation making it possible to establish such forests, has already been passed by one State and steps toward establishing a county and also a city forest, have been taken in another State. Such forests will be largely managed by scientific men.

A very important field of the forester is in consulting work. There are some very successful men making a business of this at the present time and this line of work must necessarily increase by leaps and bounds in the future. There are thousands of holders of forest land whose possessions are not extensive enough to permit a forester spending his whole time thereon and yet the owner is ready to pay for the proper management. Reforestation, surveying, estimation of fire damage and the making of working plans, are all broad subjects and fall easily to the consulting foresters.

But let us get down to the real influence of the increasing number of forest schools. From the very beginning of the forestry movement, the advocates of this phase of conservation have spent their greatest amount of

energy in bringing the public to realize what forestry was and how it could be applied to advantage. This has been the fundamental principle underlying the whole movement. The American people as a whole stand high in the scale of civilization and they also are intensely practical. As with the lumbermen, they, as a whole, only have to be educated to the fact that the end of our timber supply is in sight and that by the proper management we can hold off that evil day, as well as make a good profit, and they will manage the forest lands of the United States, both public and private, accordingly.

VALUE OF TRAINING

I can conceive of no way of reaching the people more quickly and more thoroughly than by mixing in with them a large body of trained foresters. The point will probably be made that there will be many of these men turned out who will do much to give forestry a black eye, because of impractical recommendations. That there will be these men there is no doubt, but do people throw over the engineering sciences because some engineers are impractical? Would we close our churches because there are a few hypocritical ministers? I believe that forestry, as a profession, is at the present day able to stand alone and that the time has already passed when it is necessary for the forest schools to weed out their men for the sake of forestry. It may be policy to weed out men for the sake of the schools, but not for the sake of forestry. If we are considering the advancement of forestry, let us turn out all the men we can and through competition, let the best man win.

How many lawyers are there in the country that know anything at all about forestry? Probably not more than a score. Have you ever stopped to think what the future of forest law is to be, the number of questions which will arise from the destruction of timber or forest soil, the effects of forest cover on the country, trespass suits, etc., which the high price of timber is going to cause exactness in and only those lawyers who have had a forestry training

will be properly able to handle these cases.

Forest entomology and pathology are two sciences which are only in their infancy in the United States and for the bringing out of the proper relations of insects and disease to our forests, the investigators along these lines must have a broad forestry education.

A training in forestry, no matter how small, will be a decided advantage to any man who intends to handle timber land, even though he never intends to practice forestry himself and more and more business men will acquire a forestry education that they may be better enabled to carry on their business, where such a business is allied to timber or lumbering in any way.

Many men will take the forestry courses merely because of their broadness. Is there any other profession of the present day that requires as general and broad a training as that of the forester? I for one look forward to the day when such men, men who do not intend to follow forestry, will be turned out by the thousand, these men later to bob up in our courts, our city governments and our State or National Government, or even as the every-day sort of citizen, who will be able to take themselves, as well as to be able to instruct others to take an enlightened view of forest conservation, as its principles come before the people in the form of legislation or practice.

In short, I think forestry in the United States will advance in direct proportion to the number of men who are annually turned out from the forest schools of the country.

There is to be a place for all schools, the post-graduate schools, the undergraduate schools and the ranger schools, all combined to turn out men better equipped to advance the cause of forestry and only when every university and most engineering schools and colleges give forestry courses, then and only then will the profession of forestry be on an equal footing with other professions and then and only then will the progress of forestry obtain its maximum momentum.

SPORTSMEN AND FOREST FIRES

By HON. JEFFERSON BUTLER
President Michigan Audubon Society

MR. HENRY FORD, the automobile inventor of Detroit, has a farm ten miles out at Dearborn, containing 2,100 acres. I have supervision over the work being done for the protection of birds. Before Mr. Ford came into possession, this land was farmed by many small owners. They pastured the land, including the woods, with the result that we will spend five or six years in trying to get this land into proper condition for bird life. If pasturing causes so much trouble, what would a fire mean?

We have about 60 bob-whites that do nicely, they having quadrupled their number during the past two years, but no part of the farm is in condition for grouse and prairie chickens. We did have Hungarian pheasants but they left the farm and were probably shot. I think the growth was not dense enough. If we have a light growth, we will not have our game birds and the same is true of many varieties of our song and insectivorous birds, also. Our forest fires are for the most part wanton destruction and bring irreparable injury, not only to the sportsmen, but to every member of the community, State and nation.

During the past three or four forest fires in Michigan, I received communications from naturalists concerning the destruction of bird life. One swampy place near Alpena, which was surrounded by woods, had ducks, quail, coots and some of the plovers that had nested and reared their young. A witness wrote that he saw the old birds come out in large numbers toward the lake, circle around and go back, probably for their young, and he was certain that they had all perished, as he afterwards found remains that showed that at least large numbers had been destroyed.

Professor Hill, of the Forestry Department of the University of Michigan, informs me that we are using two-

thirds more of our forests than we plant, which of course means famine in the future. He also informs me that as much timber has been destroyed by forest fires as has been used for building and every other purpose in this country. If we had the forests that have been destroyed by forest fires, we would not be in the midst of a struggle to save our land game birds from destruction.

Our water birds prefer to follow the water along the woods because they find a greater variety of food and of course in greater abundance. The sportsmen should not only take active measures to prevent forest fires, but should use their whole influence in setting adequate measures to institute the work of reforestation. Much of our land, especially in the Upper Peninsula and the northern portion of the Lower Peninsula, is better suited for that purpose than for agriculture, although I know that some products grow in abundance. The States of Ohio, Indiana, Illinois, are populous and cannot now give the land for great forests. The more northerly States should reap a harvest from their forest preserves.

Most sportsmen I have met are fond of their wild songsters and they are generally acquainted with the chickadees, woodpeckers, blue jays, the owls, hawks and other varieties of useful birds. Many of them tell me they go not so much for the outing as for the shooting. I have kept closer records in regard to the song and insectivorous birds and know that many thousands have perished in forest fires. Sportsmen go out to commune with nature, to get acquainted with wild life. Man unacquainted with wild nature soon becomes superficial and artificial. What does a devastated forest present? I know of no sadder sight in nature.

In my judgment, Michigan should follow the United States Forestry Service in providing for a patrol. The

loss through fire in their work is but a fraction of one per cent of the timber. Michigan lost about \$3,500,000 in forest fires last year. Such a defenseless condition as now obtains should not be tolerated in a civilized community, especially since it has been demonstrated that adequate means can be employed.

Every sportsman and naturalist knows that forests not only provide the necessary food for many wild birds and animals, but afford protection also for the winter. To permit the destruction of the forest means the loss of their food supply and homes. Those that are left will not have adequate protection for their nests and young, and of course, being in a defenseless

condition, their extermination will be all the more rapid.

The Michigan Audubon Society, of which I am president, was organized for the protection of all forms of wild bird and wild animal life. We offer our co-operation to those engaged in the upbuilding of our forests, knowing that if we have not forests, we will have but few varieties of the wild birds and animals. We must stand together and help each other in every way possible in order that we may not only preserve the beauty of the landscape, but the many delightful forms of wild creatures that make life better and because we owe it to posterity to pass down the splendid inheritance we have received.

ATTENTION, LUMBERMEN

THE following resolution was passed at the annual convention of the National Lumber Manufacturers Association at Cincinnati, Ohio, on May 8:

WHEREAS, THE AMERICAN FORESTRY ASSOCIATION is maintained as a voluntary public service organization to further the perpetuation and better use of our forest resources, and

WHEREAS, it is the only organization which reaches and appeals direct to the public in a popular way regarding forestry and lumber matters, and maintains for this purpose a monthly magazine known as AMERICAN FORESTRY, and

WHEREAS, the lumber industry as a whole is keenly interested in forest conservation and in means of acquainting the public with the problems of fire protection, forest taxation, freight rates, legislation, and conservative management and reforestation,

BE IT RESOLVED, that the National Lumber Manufacturers' Association endorse the work of the American Forestry Association and pledges its support to the cause,

AND BE IT FURTHER RESOLVED, THAT EACH MEMBER OF THE NATIONAL LUMBER MANUFACTURERS' ASSOCIATION BE URGED TO AFFILIATE WITH THE AMERICAN FORESTRY ASSOCIATION BY BECOMING A MEMBER AND SUBSCRIBING TO THE MAGAZINE.

A PINCHOT PRIZE

Gifford Pinchot, of the class of 1884, Phillips Exeter Academy, and former national forester, has offered a small annual prize for proficiency in woodcraft and forestry which he hopes will incite the boys of the academy to use the woods and forests on Plimpton field more than they ordinarily would.

ENGLAND'S VANISHED FORESTS

The forests for which England was at one time famous have vanished, or only exist in the attenuated form of carefully preserved woods and parks, from which can be obtained only a fraction of the supplies needed.

SIXTY-FIVE PER CENT AGRICULTURAL SOIL —WHAT OF THE BALANCE?

By THOS. B. WYMAN
Secretary-Forester, Munising, Mich.

STATE GEOLOGIST R. C. ALLEN, after wide investigation, makes the statement that of the entire Upper Peninsula acreage the soil of sixty-five per cent is suitable for agriculture.

In round numbers there are ten millions of acres in this peninsula and Mr. Allen's figures, therefore, show six million five hundred thousand acres of land upon which agricultural crops can be successfully grown.

We are all interested in the development and settlement of this great area, which, each possessing a farm of a quarter section, would permit 40,625 farmers to permanently locate among us and create that unchanging populace that brings prosperity to every community possessing it. But, while we all possess the spirit to assist in this agricultural development work, there is a progressive association, the Upper Peninsula Development Bureau, which already has this matter well in hand, and to this association we offer our assistance in so far as it may be of service.

But that which concerns us more particularly at this time is the unmentioned balance—the worthless third—the thirty-five per cent or 3,500,000 acres not fit for the plow and harrow.

In the study of forestry, we learn that there are two general classifications of soil—agricultural and forest. The agricultural soil has already been mentioned and the second classification or forest soil covers that acreage with which we as timbermen have most to do.

We learn, further, that every acre should be devoted to that crop which will pay best and since we have been forced to eliminate agricultural crops, crops of timber alone can be considered.

The agricultural presents to the timberman the very poorest soil. He takes the best to himself; but after all, this is a fair proposition for the farmer growing his tender succulent crops, must produce them quickly, must harvest them before frost, must possess a soil rich in surface nourishment, while the hardy timber crops can grow slowly; is practically free from winter-kill and takes its nourishment from deeper soil strata. Again the most valuable timber species are often the least exacting in their soil requirements as is evidenced by the magnificent and highly valuable stands of white and Norway pines stocking our otherwise valueless sandy lands.

Further, extremely rough, hilly land of high fertility which, if cleared and cropped would suffer materially from hasty run-off, through gulleying and erosion can be cropped in timber to the advantage of all.

However, an unfortunate condition obtains; the great areas of level land formerly producing pine have been clear cut. No provisions were made for succeeding crops. No protection has been offered the regeneration which sprung up from the seed scattered between a few unsound and undersized trees which were not thought worthy of the ax. Fires have crept in through carelessness of fishermen and hunters and through the design of the berry picker. Natural regeneration has been swept away, the seed trees successively damaged until their crops of seed have become too small and too infrequent to restock the area. These pine lands are, therefore, largely pine plains unproductive, uninviting, and existing as a standing argument for a higher, more highly defined and perfected system of forest utilization and management.

Let the farmer produce single crop

and then abandon his farmstead and he becomes the subject of severe criticism; is given no sympathy; is accused of laziness, shiftlessness and a poor manager; of being unworthy of the title "Farmer." But can we not apply all of these criticisms to the timbermen who have reduced the forests with no attempt to reproduce it; who have removed valuable property from the tax rolls, leaving in its stead a fire trap and menace which must constantly threaten all neighboring investments. That such methods of harvest have characterized the utilization of our forests to date is indisputable. Let us admit that there is a vast area capable of producing the crop which is the basis of our activities now lying idle. Let us admit, further, that we are collectively responsible for a large percentage of this unproductive area. I say "we" advisedly, meaning those timbermen of our Peninsula both past and present who have taken wealth from the woods and have left poverty to posterity.

Admitting our share of responsibility for the conditions which exist upon three and one-half million acres of forest soil, or upon that portion which has not been cut over, have we not a duty to perform to those who will follow us as citizens of this great forest commonwealth.

Given a huge fortune and the means of creating a reasonable and permanent interest should we not perpetuate this asset and leave it as an inheritance to those who are entitled to share the pleasures which have been showered upon us.

Were proper rules adopted for those stands of timber which now stock our poorer soils, the conditions would not grow worse. Were reasonable precaution against fire, coupled with the encouragement of natural seeding distribution and occasional artificial planting of fail places, put into practice over

our barren and partially barren lands, we could look for and experience a constant improvement, and constant betterment of conditions, and we would experience further the feeling of a worthy accomplishment. If this area were placed under strict forest management, values would begin to accrue from the moment a proper stand of young timber was established and within very few years our unmarketable plains lands, now unsightly and undesirable, would have a sale value and be in commercial demand.

Since our forest soils are diversified in character, and timber seeks the soil in which it is best adapted, our forests would show diversified species, which again would best serve the needs of our peninsula. Pine would grow where they should and hardwoods on the soil of greater strength.

The Northern Forest Protective Association is endeavoring to protect the holdings of its members from fire and trespass. Could we not well undertake the discouragement of clear cutting on absolute forest soil and the rehabilitation of its already stripped areas, donating our services in this manner to the common good? Can we not adopt some forceful measure which will be the beginning of an attempt to procure and perpetually maintain for the Upper Peninsula of Michigan 3,500,000 acres of productive forests? We need the forest covering for climatic reasons; we need the covering to ally erosion and to increase soil fertility; we need the covering to protect the game and the game birds of our forests and we need the timber. But the greatest need is that spirit of fair play which demands that when a wrong has been done, a reparation be made. Let us lay the corner stone of the greatest public forest in the world by lending our aid in the upbuilding and maintenance of the "worthless third."

MRS. WILDER'S ARTICLE

The interesting article entitled "A Famous Old Tree" in the May number of AMERICAN FORESTRY was by Mrs. Anna A. Wilder of Washington, D. C., who is shortly to bring out a book entitled "Message of the Trees." Mrs. Wilder is the vice-president of the League of American Pen Women.

ERIC OUTLOOK SYSTEM

By F. B. KNAPP

JUST as scientific fire fighting is taking the place of the cruder methods of ten years ago, so outlook stations are being located in many States throughout the country to give quick and sure notice of fires in their incipient stages. An inquiry, however, brings out the fact that the methods of locating the fires when discovered are in general very rough.

The writer has been working on this problem for some years, and has found great difficulty till lately in interesting others in it. The answers, in response to letters and a circular recently sent out, indicate, however, that many of those in charge of the suppression of forest fires are now fully alive to the importance of more systematic methods.

All but five of the States with a forest service have been heard from. In many, the work is in its infancy or very much restricted by lack of funds.

Indiana represents four States where the wooded areas are so small and the houses so close together that no systematic means of discovering and locating fires is needed. Two replies came about the same time; one from the mountains, approving the plan for comparatively level country; and the other from the plains, considering it a fine thing for mountainous districts. In New Jersey the telephone is found sufficient; and in Washington patrols and telephone prove to be most effective, because the atmosphere is obscured in the dry season by smoke from land which is being cleared. Most of the other States, as well as some private organizations, either have outlook stations established, are now installing them, or are making plans and looking forward to such a system as soon as their legislatures give them the necessary laws and money.

The national forest service locates fires from two stations by compass and triangulation; and will soon issue a bulletin by Mr. D. W. Adams, on the

location and control of forest fires. New York has the most complete system now in operation of any State; using maps, which are, however, not oriented, and triangulation. New Hampshire has adopted the system described below, and will be ready for its use for the first time this spring; while other States are giving it a more tentative trial.

My attention was called to a German apparatus described in the *Forestry Quarterly*, volume 2, p. 253. It was designed and patented by Oberforster Seitz; and divides the district into 90 radial parts, with a color and form scheme for blocks which are hung out in varying combinations to designate the direction of the fire. Also fish horns are used which carry two or three miles. The area covered is within a circle of less than two miles radius.

The plan of the Eric Outlook System is to have main outlook stations manned as near as practicable and not more than twenty-five miles apart. These are provided with an outlook table, 26 inches or more in diameter, fixed in position, with an orienter map in the center, surrounded by a divided azimuth circle, and a panorama of the country giving names and distances. An alidade, pivoted at the center, is directed toward a fire, discovered by the marked eye or field glasses; and a thread is thereby stretched across the map, circle, and panorama to show the line of sight. If the fire is in plain view it is located by the panorama and map. When the smoke rises between two ridges it is determined within certain limits by the panorama and in direction by the circle. When seen vaguely, or over a ridge with a broad unseen expanse beyond, the direction is obtained by the circle, the exact location to be determined by tying in from another station or substation.

Secondary stations, manned at times of special danger, are located on intermediate elevations and are supplied

with either the outlook table or a subtable.

Substations, with no regular observer, have a subtable, eight inches in diameter, fixed in position, with divided circle, and a pin-and-thread alidade.

All stations are connected with each other, fire wardens, and officials.

The despatcher (who may be in the District Chief's office or an observer at a main outlook station) has the district map on a large table. He is the central officer to whom fires are reported; who gives orders; and in a big fire, till superseded by a superior officer, directs the general movements of firefighters, apparatus, and supplies.

All maps, including the pocket ones of the wardens, are supplied with a thread fastened at the location of each station within its bounds and a four-inch protractor surrounding such station. The fire is recorded on the map by description; by one hearing and the distance; or by two hearings indicated by the intersection of threads.

The adoption of such a comprehensive system for the quick and accurate location of forest fires will be one more step toward obtaining the control over them which all recognize as a necessary preliminary to the practice of scientific forestry in this country.

GROWING A WOODLOT FROM SEED

By J. A. FERGUSON

University of Missouri

EVERY farm should have a woodlot to furnish fuel, fence posts and other wood material needed. Especially is this true in the less wooded regions like the prairies, where wood products must often be transported long distances at considerable expense. Nearly every farm contains some land that is too poor for raising crops or that is not available for grazing or other purposes, which usually lies idle year after year. This land is a burden to the owner because it brings in no returns, yet must bear its share of the taxes. Such land ought to be devoted to the raising of forest trees. When we consider that an acre of land planted to fast growing trees will produce from one to three thousand fence posts in twenty years, and that with some species fence posts can be secured in less than ten years, a farmer, by allowing waste places to stand idle, is losing a return he could secure by a slight effort. It is not a difficult matter to start a woodlot, neither is it an expensive one. It can be done without any cost to the owner except the time and effort necessary to grow and plant the trees.

In starting a woodlot the selection of the kinds of trees to plant is an important consideration. They must be

trees that will give the product desired in the shortest possible time, and that will be suited to the particular conditions of soil and moisture of the tract to be planted. Because a tree grows well in deep, bottom land soil is no reason to believe that the same tree will grow well when planted on high dry uplands with thin soil. Trees vary greatly in their demands. Some are naturally hardy and will grow under many conditions of soil fertility and moisture. But most trees are fastidious in their demands and will not thrive unless they receive the amount of nourishment they need. So in selecting the trees, the site to be planted must be considered first and trees chosen that are suited to that site. The trees growing thriftily on situations similar to the one to be planted should be noted, and such trees selected for the planting. Often a tree not native to the region can be found that will produce better results than native trees. Nearly all trees grow well on deep, moist, fertile soil, so it is only when a planting is to be made on poor soil that the choice of species becomes important.

One reason why farmers do not start forest plantings is because they believe large trees are necessary which can be

purchased only at considerable cost. The best trees for starting a woodlot are one year old seedlings, which can easily be grown from seed by the farmer himself. Every farm should have a forest nursery for growing trees for starting forest plantings. Such a nursery can also be used to grow larger trees for planting about the house, along the roads and for making wind-

breaks. It should be located on well drained fertile soil such as might be selected for a garden. Where the space can be spared a portion of the vegetable garden makes an ideal nursery site. The soil should not be made excessively rich, as too fertile a soil will produce a rank growth in the seedlings, making them difficult to handle in transplanting.

AROUSING SCHOOL CHILDREN

ONE MILLION circulars on the prevention of forest fires are now being sent out from Philadelphia to the schools of Pennsylvania for distribution among pupils. It is planned to place at least one in the hands of each school boy and girl in the state; any other persons who wish one or more copies can easily obtain them.

The circulars, which teach the fire prevention in a practical way, are the result of co-operation among the Pennsylvania Forestry Association, the Pennsylvania Conservation Association, the Philadelphia Museum and Lehigh University.

On the first page are indorsements by the state superintendent of public instruction, Nathan C. Schaeffer; the commissioner of forestry, Robert S. Conklin, and Governor Tener.

To print the million copies of this circular, which is merely a four-page, 6 x 9 folder, required more than five tons of paper and 125 pounds of ink. It is printed in red and black.

Cuts in the leaflet show a raging forest fire, such as one cigarette or one match will start; while a cartoon is printed showing "the fool who rocks the boat," "the fool that didn't know it was loaded," and various other fools salaaming to "The Prize Fool—the Fool That Tosses Away a Lighted Match in the Woods."

Warnings against carelessness with fire in the woods and a list of practical things to do, and another list of what not to do, are printed, together with concise information as to the indirect and economic loss which results through forest fires as well as the direct loss.

Copies of this circular are distributed free of charge from the Pennsylvania Conservation Association, Harrisburg; the Pennsylvania Forestry Association, 1012 Walnut Street, Philadelphia; the Philadelphia Commercial Museum, Philadelphia, and Lehigh University, South Bethlehem.

FORESTRY CONFERENCE IN THE WHITE MOUNTAINS

UNDER the auspices of the Society for the Protection of New Hampshire forests, and the New Hampshire Forestry Commission, the Annual Forestry Conference in the White Mountains will occur this year at Bretton Woods, Thursday and Friday, July 18 and 19, 1912. There will be a preliminary day at North Wood-

stock, N. H., in order to visit the new purchase by the Society for the Protection of New Hampshire Forests at Lost River, and a meeting at the Deer Park Hotel in North Woodstock Village on the evening of that day. The North-Eastern Foresters, an organization that includes the State Foresters, the instructors in Forestry, and a few other

professional men, from Maine to Maryland, will meet at the same time and place. There will be meetings of the New Hampshire Timberland Owners' Association, and representatives present from Forestry Associations in the several New England States.

The Governors of Maine and New Hampshire have indicated that they will take part in this Conference. Representatives of the Forest Service, and other departments of the Government at Washington, connected with the administration of the Weeks Bill, will explain the progress of the National Forest in the White Mountains. Other topics for discussion will be, the acquisition of forests by towns and States in New England, protection of forests from fire, and regulation of the flow of water by forest cover.

Special consideration will be given to the subject of taxation of forests, and leading experts upon the subject will take part. This is an important subject in New England at this time, because efforts are being made both in Massachusetts and New Hampshire to change the Constitution and permit forests to be classified separately from other property. Reports will be made on recent purchases to save forest lands, both by public and private agencies, including the purchase of the Crawford Notch by the State of New Hampshire. The sessions of the Conference at Bretton Woods will be at the Mt. Pleasant House, that makes a special rate of \$3.00 per day to members of the Conference. The Mt. Washington Hotel and the Deer Park Hotel also make special rates. A cordial invitation is extended to all who are interested.

WOOD PRESERVING AND THE LUMBER INDUSTRY

AT THE annual meeting of National Lumber Manufacturers Association, E. A. Sterling, a forest engineer, of Philadelphia, and President of the American Wood Preservers Association, in a brief address, said:

"You all know that the wood preserving industry comes into contact with the lumber industry, and overlaps it at many points. The wood preserving industry is growing faster than many of us can keep up with. In 1900 there were 11 plants in the country. The last figures were 101 plants, with a growth of 120 per cent in the number last year. The value of the product represented at present is \$40,000,000, and the gross amount of wood treated in 1910 was 110,000,000 cubic feet.

"This is of interest to you, first of all because preservation takes certain woods and species which you have a difficulty in finding a market for. In the East it takes beech, birch, maple and red oak for cross ties and like purposes. In the South it takes sap pine, gum and so on down the line. It is of

great importance because in a way it means the opening of new markets.

"In this connection there is one thing on which we ought to cooperate, and that is inspection and grades. To my mind there is a distinct gap between the official grades of your various allied associations and the requirements of the consumer for treated material. This has come up in the case of every railroad which operates a treating plant. Say they have a use for longleaf pine for various purposes. They want to get a pine which will treat better than the heart pine, but will have practically the same strength. In none of the existing specifications is anything which meets their need. The American Maintenance of Way Association has been working on this. I think it would be well to appoint a committee from the Wood Preservers' Association to cooperate with some of your committees on this question of specifications for creosoted material.

"There is one other thing, though it is still in the future. You are up against the fire question. Take

shingles for instance. I believe the time is coming when a preservative treatment, combined with a fireproofing treatment, is going to be developed for use by you as lumbermen. Although their shingles perhaps do not need a preservative treatment particularly, suppose the Pacific coast shingle manu-

facturers could advertise a preserved and fireproofed shingle, and push it as the cypress people are pushing their product in the magazines, wouldn't that counteract this movement against shingles? I believe it entirely possible to combine a preservative treatment of lumber with a fireproofing treatment for use under certain conditions."

STATE NEWS

Minnesota

Active opposition has developed to the bill recently introduced in Congress by Representative Lindbergh of Minnesota, which would allot 45,000 acres of land in the national reserve, near Cast Lake, to the White Oak Point band of Chippewa Indians. The State Forestry Service is up in arms over this attempt to cut down the area of the forest reserve, and will make every effort to have the bill defeated.

"I do not know whether this band of Indians is deserving of further allotments or not," said Forester W. T. Cox. "But I do know that they should not be given land in this reserve. The land is poor for agricultural purposes, but it has fine pine trees on it. The stand is good and the park is beautiful. There is land worth ten times as much as this north of Red Lake. If these Indians are to be given allotments it should be there, and not in the reserve.

"The timber has been cut according to scientific rules in there. There is a good second growth that is being protected, and the reserve is being given the best of forest fire protection. It is also valuable to regulate the flowage of the upper waters of the Mississippi. There is no occasion to give these Indians land in there, and it should not be done."

Washington

In the last seven years the State of Washington has appropriated \$153,950 for forest fire prevention and this year a fund of \$40,243.04 is available, says State Forester and Fire Warden J. R. Welty, who summarizes work done by the State in protecting the timber wealth and what is to be done this season.

Mr. Welty believes the State should make an annual appropriation of \$100,000 for forest fire prevention as good insurance on timber valued at \$400,000,000 in Washington. The work of the State Forestry Service for its seven years of existence, he says, has saved 6,000,000,000 feet of timber to the

State that otherwise would have been destroyed—timber valued at \$9,000,000.

New Hampshire

The Board of Forestry Commissioners has issued a circular in relation to reforestation waste and cutover land, which is being sent broadcast throughout the State.

The subjects covered in the circular are the increase of forest planting in New Hampshire, tax abatement on land planted to trees, State forest nurseries, kinds of trees to plant, how to secure trees for foresting lands, list of trees that can be obtained from the forestry commission, the preparation of land, the care of trees and the care of plantations.

Wisconsin

Plans for protection against forest fires were discussed at the first quarterly meeting of the Northern Hemlock and Hardwood Manufacturers' Association recently.

Timber land owners will meet in Wausau, Wis., soon to discuss plans for protection and adopt a system similar to the one used by the Forest Protective Association of Timber Owners of Northern Michigan.

A suggestion for a national forest products exposition was approved. In all probability it will be held in Chicago or some other large city of the Middle West.

The July meeting will be held in Holton, Mich., the date of which has not been definitely fixed.

Utah

O. W. Butler, of the district forestry service, having in charge the silvi-culture department, has gone to Boise, Idaho, where he will join District Forester E. A. Sherman and Assistant District Forester Timothy Hoyt.

From Boise the three foresters will proceed to Starkey, Idaho, where they will meet with the supervisors and rangers of that district.

The foresters are happy over the heavy fall of rain and snow of the past two months, as they say it means the saving of a great deal of money to the forest service department in the matter of preparations for, and the actual fighting of, forest fires. It cost much money to fight fires last year many of which were caused by the dry season of the early part of the year.

Kentucky

J. W. Newman, Commissioner of Agriculture of Kentucky, says of the tract of land purchased by the State near Louisville: "I am going to make of it a forest with a game preserve inside. This fall I shall plant twenty-five acres of the ground in commercial timber, used for manufacturing purposes, and each year, during State Fair week, visitors to the fair will be taken through the forestry and told the value of the different trees, just when they were planted, how long it took them to grow, and what they are used for principally from a commercial standpoint. I mean to stock the forestry with game of every kind, native to Kentucky. It will be used as a breeding place for game which will be distributed throughout the State."

Vermont

State Forester A. F. Hawes, of Vermont, in discussing forest fire protection with the fire wardens recently advised every town to keep a supply of long handled shovels, pails and sacks in several places where the wardens know where they are since oftentimes a man comes to fight a fire with no equipment with which to work. Handpumps attached to pails where water is convenient and can be brought by men are the most efficient fire fighter and it would pay every town according to Mr. Hawes to lay in a supply of two or three such pumps.

A good deal of waste expense is caused because the wardens delegate the fire fighting to others and do not keep account of the men's time. The State Forester urged prompt reports in cases of fires and more accurate statements as to cause. The most difficult report to get in is that of the cause of fires. The State department also urged that when wardens did not like to prosecute a man who might well be prosecuted under the statute the matter be referred to the department as a few prosecutions of the sort would do more than anything else to prevent careless fires in future.

Colorado

In February of 1909, in response to a request of the President of the United States and the U. S. Forester in Chief, the Governor appointed a Conservation Commission of 36 members which was organized

the month following with the Hon. F. C. Gowdy of Denver as chairman and Mr. W. G. M. Stone as secretary. Work began at once. Several meetings were held in connection with interesting programs during its life.

At the annual meeting, in 1910, the same officers were re-elected, and two or three meetings held during the year. At the second annual session, Col. Kenneth L. Fahnestock was elected president instead of Mr. Gowdy, who declined to take the presidency the third term. Before the newly-elected president got around to appoint his committees and organize his forces, he was taken sick and after an extended illness passed away, and for fourteen months the commission has lain absolutely dormant.

Whether it will rise from its sleep to new life and energy will not appear till after the State election in November, when the first vice-president, ex-Governor Adams, will order a call for a meeting. Till then it will sleep on disturbed by no sound political or economic that may threaten the natural resources of the State.

Some of the members desire its awakening; others care not a "sou" if it never wakens, and there are those who think it would be better if it were to shed its commission chrysalis and rise on the wings of a free and independent "organization." Six months must elapse before any one can know.

From appearances, conservation in Colorado, among the politicians and individuals desiring to get hold of the forest reserves and other resources of the State, is not at a premium. The people themselves, if at the helm, would doubtless have it otherwise.

Indiana

Tree experts in the employ of the Board of Park Commissioners of Indianapolis assert that widespread interest has been aroused in Indianapolis this spring over the care, protection and preservation of shade trees and shrubbery. Through the efforts of the forestry department of the Park Board in sounding an alarm, and statistics gathered from all parts of the city showing that thousands of valuable shade trees are dying annually from the blight and ravages of the San Jose scale and other plant-destroying insects, property owners have united in a concerted movement to save the trees by the methods adopted and recommended by the Park Board.

Pennsylvania

Important reforestation work is being done by the State Forestry Commission's nurseries this spring, and it is expected that when the shipment of seedlings is completed, that over 2,000,000 young trees will have been sent out. The majority of the

trees being shipped are white pine, and the fact that the State has been able to furnish so many for its own reserves and to private parties who agree to take care of them, illustrates the wisdom of the establishment of the nurseries several years ago.

The State has three nurseries, one in Bedford, one in Huntingdon and one in Tioga, with Mont Alto helping along. They are all on State reserves and have proved of great importance in the State's work in districts where replanting was necessary to conserve the water supply. Last year close to 2,000,000 seedlings were shipped.

Michigan

The State Game, Fish and Forestry Department has demonstrated that between 75 and 80 per cent. of the disastrous forest fires in Michigan in recent years are traceable to the carelessness of homesteaders and campers, according to John A. Higgins, the department's inspector of railroad locomotives and rights-of-way. A small percentage of the fires have been caused by sparks from locomotives and it is the duty of Mr. Higgins to see that railroads equip their engines with devices to prevent these fires.

Mr. Higgins is on a tour of inspection of the railroads of Michigan. He examines the equipment, the conditions along the rights-of-way that might be changed as a measure of fire prevention and advises railroads how to prevent fires.

Massachusetts

Campaigns for the prevention of waste are young as yet in this country, and yet they occasionally make their presence known. Almost every year Massachusetts has been the scene of destructive forest fires. One of the commonest reasons of the great waste through this cause has been that the fires gained great headway before they were discovered. To guard against this there has been established a chain of signal towers, reaching all the way from the coast to the New York State line. In these men will be stationed at all hours of the day and night, and it is felt that no fire can gain much of a start before it will be discovered.

New Hampshire

The danger from forest fires is called to

the attention of the people of the State in a circular issued from the office of State Forester E. C. Hirst, which follows:

It is extremely dangerous to leave slash and cut bushes along the railroad lines. Every year the railroads clear their right of way of inflammable material, but to insure safety a wider strip should be cleaned. If at this time land owners would co-operate with the railroad companies in clearing brush where cuttings have been made along the tracks, a great many fires would be prevented.

In nearly every town there are some heavy slashings along the most frequented roads awaiting the lighted match or cigar from a passing vehicle. Town selectmen and timberland owners would do well to clear the brush for a few feet along the roads where timber cutting has left an inflammable slash.

A little forethought and attention to such matters would lessen the fire danger materially and reduce the expense which the towns and the State bear in fighting forest fires.

Oregon

Giving a warning to all timber owners as to the burning of slashings, State Forester Elliott has issued the first circular of the season as to fire protective work by the State Board of Forestry. In the circular he calls attention to the necessity of burning slashings at favorable times as being a question of the greatest importance.

California

The forest rangers under R. H. Charlton, supervisor of the Angeles forest reserve, in conjunction with help to be furnished by J. M. Beard, who will this year have charge of the Sturtevant Camp in the Big Santa Anita canyon, will shortly begin construction of what forest rangers say will be the most picturesque trail for travelers in the Sierra Madres.

The trail will branch off the old Sturtevant trail at the Hermit's and will then follow the bottom of the canyon alongside Big Santa Anita Creek up to Sturtevant's. It will lessen the distance between Sierra Madera and Sturtevant's camp by three miles and will be a much easier grade the whole way, cutting out entirely the rattlesnake trail beyond Hoegee's camp.

NEWS AND NOTES

Forest Patrol Men

State Forester E. M. Griffith has appointed the following federal patrolmen for the forest reserves in Northern Wisconsin: T. B. McNutt, Minocqua; Guy Morrill, Gagen; M. H. Thompson, Rhinelander; H. M. Dunham, Woodruff; Fred Melby, Sayner, and T. D. Arnold, Rhinelander. The appointments are made in co-operation with the United States forest service. The patrol will work with the State forest rangers in protecting the timber at the headwaters of the Wisconsin and Chippewa rivers from forest fires. The government allows the State forestry board \$5,000 for the employment of these men.

The patrol will cover not only the State's reserves, but private lands in the midst of and adjacent to them. When not needed in protective work of that kind, they will be engaged in building roads, trails and fire lines. Most of the patrolmen will be mounted on horses. Those on railroad lines will be provided with hand-propelled velocipedes.

Fire Protection

Supervisor Nelson Macduff of the Santiam forest reserve in Oregon states that during the last year many important pieces of trail work have been finished to protect against forest fires. Mr. Macduff states that the government has purchased material for a telephone line 60 miles in length. This line will help protect the government timber on the Santiam reserve in Linn and Marion counties, and besides be of benefit to the private timber on the reserve.

Protective Association Active

The Northern Forest Protective Association of Michigan which was formed at a meeting of the timber owners of the upper peninsula held in Marquette a year ago this spring, will commence its season's work in the course of the next ten days. The object of the association is to protect the standing timber of the upper peninsula from being devastated by fire and to this end twenty rangers are kept patrolling the wooded sections north of the straits from early spring until after the beginning of winter. The work of the association last year proved a decided success and resulted in the saving of timber whose value mounted well up into the thousands.

Branch Organizations

The Massachusetts Forestry Association, which for the past 14 years has been actively engaged in agitating better forestry laws, has started to organize branch organizations in nearly all the large cities of the State. Organizations have already been formed in Worcester and Fitchburg, and the work of organizing a branch in this city is now under way. The purpose of these branch organizations is to bring members of the State organization together for local work.

Encouraging Tree Growth

The growing of trees in New York State has been penalized by taxing the crop as though it were a yearly crop; like wheat or oats, explains *The New York Times*. In order to pay the tax and escape its future burden, the farmers have been compelled to cut down their trees and market them. Now the Legislature has remedied this. The newly enacted Jones law exempts from assessment and taxation for thirty-five years parcels of one to 100 acres, which shall be planted for forestry purposes, with not less than 800 trees to the acre, while lands underplanted, with less than 300 trees to the acre, shall be assessed for thirty-five years at "50 per cent of the assessable valuation," exclusive of the forest growth. That puts a premium upon the planting of trees.

Aiding Floods

People who do not believe that cutting of forests about the head waters of streams will increase floods should read a recent bulletin of the government forest service, dealing with floods in the Castle Valley of Utah.

Previous to the settlement of this valley in 1878, there were no floods. Later, when cattle and sheep were pastured on its hillsides, destructive floods became very common, and would even follow a sharp summer rain. A committee of stock growers and farmers investigated the subject, and decided that the close cropping of the forage by cattle and sheep had let the water run off quickly into the valleys. Since grazing was restricted, the floods have largely ceased.

If such a slight obstruction as the light grass of the hillsides operates to hold water back and equalize its flow, how much more must the rich vegetable mould that gathers on and in the soil under the leafy protection of a thick forest?

Purchase of Lands

At a meeting recently at the office of the Secretary of War, the National Forest Reservation Commission had under consideration the advisability of purchasing lands in Virginia and West Virginia on the headwaters of the Potomac River, in North Carolina on the headwaters of the Nanthala River, and in the White Mountains in New Hampshire. These are areas in which a large number of tracts have been examined and appreciated by the Forest Service.

Specific recommendations were made by the service for the purchase of the tracts in Virginia, West Virginia and North Carolina, but no final action was taken.

With reference to the White Mountains final action by the commission cannot be taken until a report is received from the Geological Survey. The director of the survey reported that the field studies are progressing rapidly, and that he hopes to make a report within the next couple of weeks.

Sequoias for Florida

Four young scions of the Sequoia Gigantea family, which for 5,000 years has made its home exclusively in California, are to be transplanted from the big tree grove in California Redwood Park, Santa Cruz County, to Tallahassee, Florida.

The request for the trees, four feet high, was made by Governor Gilchrist of Florida, and was granted by Governor Johnson, who authorized State Forester G. M. Homans to superintend their removal from the forest.

Two of the trees are to be planted in the park surrounding the capitol at Tallahassee, while the other two will be placed in the grounds surrounding the executive mansion.

Forester Opposes Engineer

Questioning the authority of State Engineer Lewis of Oregon to issue a permit to F. W. Ross for the appropriation of the waters of the Breitenbush Springs, because they are not ordinary waters, but contain medicinal properties, George H. Cecil, forester for the district embracing the National Forest Reserve of Oregon, has written him on the subject.

He declares that Ross has applied to the Federal Government for the use of the lands where the springs are located as he contemplates laying some pipelines and building some bath houses. Under the statutes of the

United States, he says, it is his opinion that the only waters over which the State exercises jurisdiction are those used for power, domestic and irrigation purposes.

Arousing Forest Interest

With 800,000 acres of unimproved farm land in New York State, which is the best adapted for the growing of forests, the State Conservation Commission is endeavoring to arouse interest throughout the State as to the importance of planting trees for reforestation purposes. The commission has arranged a table showing the amounts of land in which this work can be carried on, devoting these tracts to the purpose for which nature intended them.

Forest Reserve Receipts

The Senate Committee on Agriculture has adopted an amendment to the agriculture appropriation bill providing that 25 per cent of receipts from forest reserves shall be spent on reserves where moneys originate, for construction of roads. Also an amendment increasing direct appropriation for road construction in reserves to \$225,000. Another amendment adopted appropriates \$35,000 for fighting alfalfa weevil and \$15,000 for studying sugar beet insect pests.

Seedling Distribution

Prof. J. Fred Baker, head of the Michigan Agricultural College Forestry Department, says the distribution of seedling forest trees this season has exceeded the records of all former years. Up to date 100,230 seedlings have been sent out and the distribution will continue as long as there are any trees left. The orders are not as large as in former years, but there are more orders and they have been coming largely from the southern and eastern sections of the State for the development of farm wood lots. The college is issuing bulletins of instruction on the care of wood lots.

The junior students in the forestry department are being placed for their summer work. Four have been found places in California, four in Colorado, fourteen in Montana and two in Arkansas. The young men will receive \$50 a month. The sophomore class will spend the summer in camp on the David E. Ward estate from June 19 to August 10, and will study surveying and timber cruising.

THE PHILIPPINE FORESTS

The forests of the Philippines, according to official figures, contain 200,000,000 board feet of lumber, half as much is in the forest reserves of the United States, but on one-eighth the area.

BOSTON'S TREE PLANTING

The city of Boston has appropriated \$25,000 for expenditure in tree planting and maintenance. Half of the amount is to be expended on trees already planted and the other half is to be used for setting out additional trees.

EDUCATIONAL

Dean Miller Resigns

The announcement of the resignation of Professor Frank G. Miller, Dean of the College of Forestry at the University of Washington, comes to every forester with a sincere feeling of regret. Dean Miller will sever his connections with the University to become Secretary-Treasurer and Local Manager of the Columbia-Wenatchee Fruit Company, an organization that will engage in an international fruit commission business. The new departure in Professor Miller's career will be a distinct loss to the profession and especially so in the Pacific Northwest where the foresters and many of the lumbermen have learned to recognize in him a powerful force in the local development of forestry. As he will continue to make Seattle his home we may still hope that he will find time to keep up his interest and continue in a general way to be a force in the betterment of forestry conditions in the Northwest.

Mr. Miller was born at Lenark, Illinois, June 2, 1866. His early training was received at the Iowa State Normal School. From 1893-1899 he was Superintendent of Schools, first at Parkersburg and later at Dunlap, Iowa. During this period he spent some of his summers in study at the University of Chicago. In 1900 he received the degree of Ph.B. from the University of Iowa, in 1901 B.S.A. from the Iowa State College, and in 1903 M.F. from Yale University.

He immediately entered the United States Forest Service and was placed in charge of forest planting investigation in Nebraska. This work gave him a most excellent opportunity to become thoroughly familiar with the especial needs of forestry in that region and before the close of that year he was called to the University of Nebraska to organize a Department of Forestry. His broad educational foundation and his extensive experience in teaching especially fitted him to undertake this work. Under his direction the school advanced rapidly and when he left there in 1907 to organize the College of Forestry at the University of Washington the Nebraska School was recognized as one of the established forest schools of the country.

At the University of Washington, where the department was to be organized as a separate college and the local conditions for instruction in forestry are exceptionally good, Professor Miller soon controlled his opportunities, so that the growth and development of the College have been remarkable. During the five years since its organization the College of Forestry has grown under Dean

Miller's direction to an institution with three distinct groups of study and two short courses that at present meet all the requirements for instruction in forestry in the region. The School of Forestry at Nebraska, and the College of Forestry at the University of Washington, will always stand as a monument to Prof. Miller's active interest in forestry in this country.

Since he first took up the work of forestry, Prof. Miller has carried on extensive studies in forest extension and has published several pamphlets on this subject. During the past year he has made an extensive study of Forest Taxation in conjunction with Mr. Frank B. Kellogg of the Forest Service. This work will probably be published before the close of the year.

Professor Roth to Remain at Ann Arbor

It was announced earlier in the winter that Professor Filibert Roth, head of the Forest School at the University of Michigan, was to go to Cornell the coming summer, to take charge of the forestry work at that institution. Professor Roth has changed his plans and will remain in Michigan.

Cornell to Have \$100,000 Forestry Building

Governor Dix of New York has approved the bill passed by the State Legislature appropriating \$100,000 to Cornell University for a forestry building. Plans for the building are now being drawn, and it is expected that ground will be broken this fall, and that the building will be ready for occupancy at the opening of the University in September, 1913.

The trustees of Cornell University, at a meeting held on April 27th, adopted the degrees to be given to foresters graduating from Cornell. The course will cover five years, with the degree Bachelor of Science at the end of the fourth year and Master in Forestry at the end of the fifth year.

As Professor Roth is not to come to Cornell, Professor Walter Mulford is to have charge of the department, and will have three other professors with him.

The department now has about 300 acres of land available for forestry purposes within three miles of the University campus. Part of this is open ground to be used for experimental and demonstration plantations. Included in the area are also 9 woodlots, presenting a variety of silvicultural conditions and problems. White pine, hemlock and hardwoods are all well represented in these stands.

Colorado School Sells Land

On March 1, 1912, Colorado College sold 3,240 acres of its Manitou Park Forest Reserve of 9,560 acres. The land sold was valuable only for agricultural and grazing. There was on it also a summer hotel. The result of this sale is to give the School an excellent beginning for an endowment fund, and to relieve the faculty of much administrative work in connection with the ranch and hotel. The remaining portion of the reserve, 6,320 acres, is practically all timbered and Western Yellow Pine and Douglas Fir. The School retains the group of cottages which have been used as head-

quarters for field work. The reserve, with its present area, offers excellent opportunities for conducting an object lesson in forestry. The stand of timber is about 10,000 M. feet B. M., and the annual growth about 300 or 480 M. feet B. M.

This spring the senior class has been transferred to the lands of the Castilla Estates Development Company in Northern New Mexico for mapping, estimating and the preparation of a working plan. This arrangement not only gives the students opportunity to see timberlands different from those at and near Manitou Park, but also enables the School to carry out a project which the company has been anxious to have executed.

RECEIPT FOR A RANGER

By J. B. CAMMANN

First get a big kettle and a fire that's hot,	A man that knows trees, and don't leave from the list,
And when everything's ready throw in to the pot,	A telephone man, and a fair botanist.
A doctor, a miner, of lawyers a few,	The next one that's added must be there, that's a cinch.
At least one sheep herder and cow boy or two.	It's the man that will stay when it comes to a pinch.
Next add a surveyor, and right after that	Add a man that will work, and not stand round and roar
A man with some sense, and a good diplomat.	Who can do ten thousand things and then just a few more.
At least one stone mason, then give it a stir,	Now boil it up well and skim off the scum,
And add to the mess one good carpenter.	And a Ranger you'll find in the residuum.

DO WE ENCOURAGE FOREST FIRES?

The destruction caused by forest fires in North Carolina during 1911 was very little less than that reported for 1910, according to a compilation being made by the North Carolina Geological and Economic Survey, and soon to be published. Only one-third of the townships of the State have sent in reports, but enough has been learned from them to show that no great reduction in the annual damage done by fires has taken place. This damage is estimated to approximate \$450,000, which includes estimated damage to young growth, which in many cases exceeds the damage done to the standing timber. The number of fires reported was 637, which is slightly less than those reported last year and slightly more than was reported for 1909.

PAMPHLET ON ARBOR DAY

The Public Library of Jersey City has just published a useful little pamphlet entitled "Arbor Day and some facts about Trees." This publication is not only a useful handbook for school teachers and the public generally, but is also a valuable contribution to the cause of conservation. The origin and history of Arbor Day and the benefits derived from its observance are briefly stated, and the value of forests and various interesting facts about trees are given in a short, concise form.

QUESTIONS AND ANSWERS

Many of our readers frequently desire to secure some expert advice regarding various features of forestry work, and do not know to whom to apply for the information.

The Editor has accordingly decided to establish this column in which he will be glad to publish such questions as may be sent to him, and give the answers, whenever the questions relate to any detail of the work which this Association is doing or such information as it can give.

The Editor requests that communications be written on one side of the paper only and if possible, be typewritten.

Brunswick, Maine.

EDITOR.—Will you kindly send me any information possible upon possibilities and opportunities for college men in forestry? By college men is meant men with an A.B., or equivalent, degree who contemplate a graduate course.

EDWARD W. KENT.

There are abundant opportunities, and they are increasing, for the practice of forestry by competent, trained foresters. Salaries are not large, but they compare favorably with those in any other profession and they are tending toward a higher level. The opportunities are found in the National Forest Service, which employs a large number of men and furnishes valuable experience in various fields; in the forest services of the different States, many of which are going into this work and paying fair salaries to good men; and there is also an increasing call for foresters in practical lumbering, as the lumber companies and others that are working in forest products see the need of scientific handling of their properties. So much for the opportunities for work. The three leading schools that are open to college graduates are those at Yale, Harvard and Michigan. For the man who wishes to rise to the highest point in the profession, and who has the educational equipment to begin with, one of these schools will be best. You can, of course, secure detailed information in regard to their courses, terms, etc., by writing to the schools.—*Editor.*

Columbus, Ohio.

EDITOR AMERICAN FORESTRY.—A gentleman whom I know asserts that at one time the Sahara Desert and all other desert areas were covered with dense forests. Will you kindly tell me if this is true?

JOHN W. WINN.

So far as I am aware, there is no evidence whatever that the desert lands of the world have ever been covered with forests during historical times. It is, of course, possible that in some previous geological era with different climatic conditions, forests existed where deserts are now found. In most of the desert regions which are found today, the precipitation or the humidity of the air is too low to permit of tree growth. In most of these regions trees could be grown if water was supplied artificially by irrigation, but under natural conditions the extreme aridity of the country makes their establishment impossible.

It is possible that the gentleman who brought the matter to your attention referred to lands which are known to have been covered with forests within historical times, but which have since been denuded and may be completely barren. This has happened in a number of regions, especially in the mountains where the reckless destruction of the forest has been followed by torrents and erosion which have destroyed the soil cover and have prevented the reestablishment of tree growth.

S. T. DANA,
Editorial Advisory Board.

New York City.

EDITOR AMERICAN FORESTRY.—Will you kindly give me full information regarding the prices of lumber at various periods and whatever information you may have regarding timber conditions in the United States?

J. F. GRAY.

This information takes up too much space to print here; so, through the kindness of O. T. Swan, in charge of the Office of Products of the Department of Agriculture, the detailed information has been mailed.—*Editor.*

THE AMBITIOUS TREE.

An unusual publicity project is being conducted jointly by the school authorities of several of the Pacific Northwestern States and the Western Forestry & Conservation Association in distributing through the public schools several hundred thousand copies of a story called "The Ambitious Tree," written by E. T. Allen, to interest boys and girls in forest protection and especially in preventing forest fires. Over 165,000 are being placed in Washington and Idaho schools alone. The story tells of the life and struggles of a western forest tree and the part it plays in community development and prosperity.

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